

Section of the History of Medicine

President K. Bryn Thomas FFA RCS

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Papers

Gideon Algernon Mantell
LLD FRCS FRS (1790–1852)
Surgeon and Geologist: ‘Wizard of the Weald’
[Abridged]

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Gideon Algernon Mantell (Fig 1) was a true son of that delectable corner of South-east England, the county of Sussex. Between the chalk hills forming the North and South Downs is a smooth fertile area known as the Weald, and it was on the verge of this wealden district that Mantell lived until he reached the age of 43 years.

He was born in the ancient county town of Lewes on February 3, 1790, the third son of Thomas Mantell, a cordwainer (in other words a shoemaker) who had a workshop in Fisher Street and a residence in St Mary's Lane. His pedigree shows that among his ancestors was a Thomas Mantell who was headborough of Lewes in 1562 and constable in 1572. Very little is known about Mantell's father except that he was a Wesleyan of high integrity and whig principles. His early education began at a dame's school in Fisher Street, and was continued at an academy opposite Cliffe Church. He was precluded from attending the local grammar school owing to his father's religious principles, so he was sent to Swindon to live with his uncle the Reverend George Mantell, a Congregational minister, in order to attend a school in that town. Here he had the companionship of his cousin George, a lad about his own age, who later became a doctor and practised at Farringdon, Berkshire. When he reached the age of 15 he was apprenticed to a surgeon at Lewes named James Moore, and in the last year of his bondage he went to



Fig 1 Gideon Mantell in 1837; showing a femur of iguanodon with the corresponding bone of the existing iguana

(Figs 1 & 2 are reproduced from Spokes 1927, by kind permission)

London to 'walk the hospitals' and attend lectures on professional subjects. In 1811 at the age of 21 he passed the examination for the diploma of MRCS, and after qualifying as a surgeon he returned to Lewes as medical assistant to his former master, James Moore. In May 1816 he married Miss Mary Ann Woodhouse (Fig 2), daughter of George Edward Woodhouse, of Maida Hill, Paddington. Two years later James Moore retired and sold his practice to Mantell for the sum of £95 per annum for a period of seven years. He purchased two houses in

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Fig 2 *Mrs Mantell*

Castle Place, Lewes, which he converted into one large house which provided ample accommodation for his surgery, and also for his museum, in which were displayed his collection of fossils, which already numbered many thousands. Four children were born of his marriage to Miss Woodhouse, two girls and two boys, and they were all baptized at St Michael's Church, Lewes.

Mantell held two professional appointments, one as a parish doctor and the other as an army surgeon. He was parish doctor to three parishes in or near Lewes, for each of which he was paid £20 per annum for visits and medicines, with 10s 6d for a midwifery case and 2s 6d extra if more than three miles distant from the surgery. Despite much night work and long hours spent away from the surgery, he was a keen man-midwife, delivering some three women each week. In 1828 he published an article in the *London Medical Gazette*, entitled 'On the Secale Cornutum', in other words on ergot of rye. Mantell stated in his article that he had delivered 2,410 women in the past fifteen years, with only two maternal deaths, one from uterine hæmorrhage, and the other from syncope without apparent cause. This was indeed a remarkable achievement. Dr Bisset Hawkins, author of 'Elements of Medical Statistics' (1829), compares Mantell's ratio of one death in 1,205 cases with the mortality rate in lying-in hospitals: for instance, City of London, 1 in 70; Paris, 1 in 30; Edinburgh, 1 in 100; Dublin, 1 in 223. He attributed his

success as an obstetrician to 'a very light hand, and delicacy of touch; and this', he said, 'will account to my giving less pain in my manual operations'. The article was written for the purpose of drawing the attention of the medical profession to the use of ergot in delayed labour. Given as either a powder or a tincture, said Mantell, labour pains were induced in from ten to twenty minutes, and labour was completed in from a few minutes to one-and-a-half hours.

In 1816 Mantell was appointed 'a military surgeon' with 'medical superintendency' of the Royal Artillery Hospital at Ringmer, near Lewes, a post he occupied for sixteen years. A few beds in the hospital were always occupied by soldiers who were being treated for wounds inflicted by corporal punishment, and Mantell was much affected on hearing that a soldier had died as a direct result of undergoing the punishment of flogging. One of his duties at the barracks necessitated his attendance at what he called 'that horrible and iniquitous punishment'. He was so shocked and disgusted by what he had witnessed on several occasions that he had decided to resign his appointment, when the sudden removal of the commanding officer put an end 'to this dreadful method of maintaining discipline' (*The Times* 1835). After this, offenders were punished by solitary confinement or extra drill, and these methods were more effectual in upholding the strictest discipline, proving that it was possible to maintain discipline without resort to corporal punishment and, what is more, securing for the officers the respect and loyalty of the troops under their command.

In or about the year 1811 Mantell 'met a remarkable man, who without doubt inspired and influenced him in his future career'. This man was James Parkinson of Hoxton, medical practitioner and oryctologist, author of a work on fossils, 'Organic Remains of a Former World' (1811), which Mantell described as 'a memorable event in the history of British Palæontology'. Forty years later Mantell edited 'A Pictorial Atlas of Fossil Remains' (1850), which contained 70 plates with 700 illustrations of fossils reproduced from Parkinson's original plates, which Mr Bohn the publisher had acquired after Parkinson's death.

Spokes (1937) describes how Mantell snatched from the shadow of the gallows a poor woman who had been sentenced to death by hanging. In the year 1826 Hannah Russell, aged 32, and her lodger, a youth of 19, were accused of poisoning her husband Benjamin Russell, aged about 40. The husband and the lodger were in the act of stealing corn from a neighbouring farm in the dead of night, when Benjamin Russell, who was carrying a heavy sackful of corn,

suddenly collapsed and died. Gossip among the villagers of Burwash, where they lived, soon produced some circumstantial evidence pointing to Mrs Russell and the lodger as having caused the death of Benjamin Russell. One witness said that Mrs Russell had been seen purchasing a packet labelled 'poison' at the village shop, while another witness said that Mrs Russell had been seen spreading a white powder on a slice of bread and butter, which she said was for the mice. A post-mortem was performed and the coroner was told that a drachm of arsenic had been found in the stomach of the deceased.

At the trial, which took place at the Lewes Assizes, Mrs Russell and Daniel Leney were found guilty of the murder of Benjamin Russell and sentenced to be hanged. Mantell, who was present at the trial, was far from being satisfied that the deceased died from arsenical poisoning, and claimed that the arsenical tests used by the medical witness were inconclusive, a claim which was upheld by Professor Brande and four eminent doctors. Furthermore, Mantell had evidence that the deceased suffered from angina pectoris, which he was convinced was the cause of Benjamin Russell's death. As a result of Mantell's efforts Hannah Russell was granted a free pardon by the King, and set free. And what of the youth, Daniel Leney? Mantell was too late – he had already been executed.

In the year 1822 Mantell, now 32 years of age, had been in practice at Lewes for ten years. With his capacity for hard work, his dynamic drive, and his pleasant personality he had built up an extensive and lucrative practice, and at the same time he had worked indefatigably, in his leisure time, mapping out the geology of Sussex and identifying the strata and the fossils embedded in them. The results of his geological researches were published in three volumes, the first in 1822, the second in 1827 and the third in 1833. The first was a quarto volume of 330 pages, illustrated by 42 woodcuts engraved by Mrs Mantell. It was entitled 'The Fossils of the South Downs, or Illustrations of the Geology of Sussex', and it was dedicated, as was also the second book, to his friend Dr Davies Gilbert *MP FRS*, President of the Royal Geological Society of Cornwall, who lived at The Manor House, Eastbourne. The second book was entitled 'The Fossils of Tilgate Forest', and the third 'Geology of South-East England'.

As a keen rock-hunter investigating the strata of his native county, his happy hunting-grounds were the quarries and chalk-pits scattered over the South Downs near Lewes. At Whiteman's Green, near Cuckfield, in the centre of that ill-defined, almost mythical Tilgate Forest, was a quarry, and it was here, in the summer of 1822, that Mrs Mantell discovered 'a mutilated fragment of a

tooth' belonging to some animal, 'which', said Mantell, 'led me to suspect the existence of a gigantic herbivorous animal in the strata of the Tilgate Forest'. He had never come across anything like it before, and neither had his fellow palaeontologists; nor had Baron Cuvier, the foremost comparative anatomist and palaeontologist of his age, who erroneously thought it was the tooth of a rhinoceros. In vain did Mantell study the skeletons of vertebrate animals in the Hunterian Museum, until, one day, a Mr Stutchbury showed him the jaw-bone of an iguana, a Central American lizard, and he immediately saw the resemblance between the fossil tooth and the tooth of its recent prototype. Vigorous searches produced more teeth as well as the bones of some gigantic animal, which he named the *iguanodon* (*iguana-toothed*). In a letter to his friend Davies Gilbert, Mantell said that he proposed calling it the *iguanosaurus*, in strict accordance with the nomenclature of Buckland and Conybeare (*ichthyosaurus*, *peliosaurus*, &c.). A reconstruction of an *iguanodon* (Fig 3) shows that it walked on two powerful hind legs and had feet each with three toes like a bird's foot. Its length was about 23 feet and its great height of 12 feet enabled it to reach its food, the conifers and cycads, which it

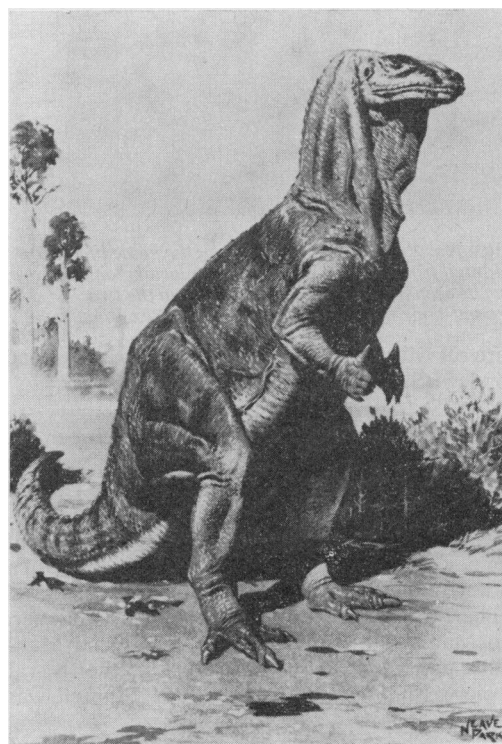


Fig 3 *Reconstruction of Iguanodon mantelli*. Courtesy of the Trustees of the British Museum (Natural History)

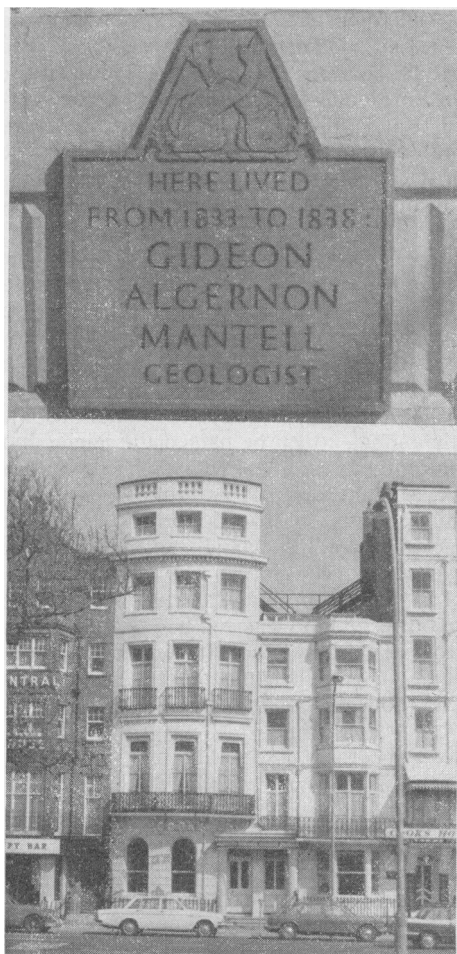


Fig 4 No. 20 The Steyne, Brighton, the home of Gideon Mantell from 1833 to 1838. The memorial plaque, above, can be seen in the lower picture between the two ground-floor windows. Courtesy of Dr Rex Binning

tore off with its spiky thumbs and short five-toed forelegs (Swinton 1965, 1969).

In a letter to Davies Gilbert (November 12, 1824) Mantell expressed his 'anxious wish to become a Fellow of the Royal Society'. He had tried to get into the Society in 1823, but relinquished the attempt. He thought the discovery of the new reptile in Tilgate Forest would give him a more favourable introduction, and he asked Gilbert to propose him in the customary manner. On March 5, 1825 Gilbert communicated Mantell's paper on the iguanodon to the Royal Society, and on October 28, 1825 Mantell was elected a Fellow.

In 1832 Mantell discovered in the Tilgate Forest the fossil remains of a new genus of

dinosaur, which he named the *hylæosaurus* (lizard of the Weald) to denote its connexion with the wealden geological formation; after this the Reverend Dr Buckland always referred to Mantell as the 'Wizard of the Weald'. The wealden district or Tilgate Forest, according to Mantell, consists of the chalk strata and the wealden strata; in the chalk are embedded the remains of fish and marine animals only, while the wealden teems with the remains of land and freshwater animals only. Mantell thus proved the freshwater origin of the sedimentary rocks which comprise the wealden series of strata. In 1834 a considerable number of the bones of an iguanodon were discovered in the sandstone of a quarry at Maidstone, but the discovery of some twenty-three fossil skeletons of the genus iguanodon, in various stages of completion, in a coal-mine in Belgium in 1877 have left no doubt as to the correctness of Mantell's observations and deductions.

In a letter to Davies Gilbert, dated November 12, 1824, Mantell says: 'as I have not received that encouragement in my profession from the gentry of this neighbourhood that I had reason to expect, I have long had an eye on Brighton, as affording a wider and more lucrative field of exertion.' He had for years spoken of his desire to move to Brighton and on January 28, 1831 he jotted down in his journal: 'Shall I leave this dull place . . . Prudence with four children says stay where you are. But ambition and my friend . . . say go and prosper.' He leased a house, 20 The Steyne, Brighton (now Cook's Hotel), and moved in on November 1, 1833 (Fig 4). In the meantime his elderly patron the Earl of Egremont presented him with £1,000 to relieve him of financial worries while he was building up a practice.

In 1835 Yale College in the United States conferred the degree of Doctor of Laws on Mantell. Benjamin Silliman, professor of chemistry and geology at Yale and Mantell's correspondent for twenty years, had doubtless called the attention of the president and senate to Mantell's geological discoveries.

The Sussex Scientific Institution and Mantellian Museum was founded in 1836 with the object of taking over Mantell's collection of fossils, and providing a permanent geological museum at Brighton. 'Nothing would afford me greater pleasure', he wrote in his letter to Davies Gilbert, 'than such an arrangement, for it has always been the height of my ambition to be the founder of the first scientific collection in my native county.' Mantell now commenced lecturing on geology

and these lectures formed the substance of his book 'The Wonders of Geology'. As a lecturer he had no rival; he had the attractive personality of an actor, he had a voice of great power, with a clear enunciation and pleasing musical cadences, and he could hold his listeners spellbound. It was at Brighton that he was able to exercise to the full his talent for public speaking. Most of his lectures were given in aid of charities; for example, he gave a lecture in aid of the County Hospital, and in return was made a governor. His success as a lecturer aroused the envy of contemporary lecturers and professional rivals. 'So much jealousy and envy', he said, 'is ejected by my talent for public speaking that if I wish for peace I must not appear as a lecturer.'

The Sussex Scientific Institution took over 20 The Steyne, lock, stock and barrel. The family were moved to Southover, near Lewes, and Mantell himself went into lodgings in the Steyne, a step which led ultimately to the break-up of his family and the wrecking of his home life. 'There was a time', said Mantell, 'when my poor wife felt deep interest in my pursuits and was proud of my success, but of late years that feeling has passed away, and she was annoyed rather than gratified by my devotion to science.' The Sussex Scientific Institution failed to raise the £5,000 required to purchase Mantell's museum, and his patron, who would have helped, died. This was a bitter disappointment for Mantell as it had taken him twenty-five years to build up the museum and had cost him more than £7,000 for specimens. It was finally sold to the Trustees of the British Museum for £4,000. Anxiety concerning the decline of his practice, and ill-health, caused him to consider leaving Brighton and taking a practice in a London suburb. He purchased the practice of Sir William Pearson at Clapham Common, and on September 29, 1838 he moved into Crescent Lodge, Clapham Common, which is still extant as 28 South Side, Clapham Common, and is now occupied by two dental surgeons.

In 1836 Mantell published 'Thoughts on a Pebble, or a First Lesson in Geology', a small volume which he had written at the request of his little son Reginald Neville, and in 1838 he published 'The Wonders of Geology' in two volumes, which was the substance of his popular lectures on geology delivered at the Mantellian Museum and edited by the curator, G F Richardson. Both the 'Pebble' and 'Wonders' reached eight editions. The latter was translated into German, and published separately in the United States.

In 1841 Mantell helped to found the Clapham Athenæum, a society for the advancement of

literary and scientific knowledge, and here he lectured regularly on geology until the year of his death. His gratuitous efforts were rewarded when the public presented him with a testimonial in the form of a 100 guinea microscope which opened up a new field of scientific research, the study of the animalcules which abounded in the ponds of Clapham Common, and the results of his observations were afterwards published in a little book entitled 'Thoughts on Animalcules, or, A Glimpse of the Invisible World Revealed by the Microscope', which was first published in 1846. The *Lancet* reviewed it at some length, for it aroused a great deal of interest, and it is noteworthy because it contains a passage in which Mantell foretold the germ theory of disease.

In his lifetime Mantell published some 67 books and papers, 10 of them contributions to the *Philosophical Transactions of the Royal Society* and 19 to the *Transactions of the Geological Society of London*. I have traced 9 contributions to the *Lancet* and one entitled 'Remarks on Partial Fracture of the Radius' (Mantell 1841) is of some interest as it is believed to be one of the earliest descriptions of what is now known as a greenstick fracture. Mantell said that in the twenty-five years he had been in practice he had seen 6 cases, all in children under 9 years of age. He said he had been taught that a partial transverse fracture was impossible; 'But I am convinced', he wrote, 'that a bone may be bent, and the convex portion of the curve be cracked yet the fracture be incomplete, and unattended with loss of continuity as a tough twig may by bending be partially broken, and remain permanently curved, although not disunited.'

It was while living at Clapham that Mantell published 'The Medals of Creation' (1844), a term for fossils first used by Bergman, a Swedish geologist. The alternative title was 'First Lessons in Geology, and in the Study of Organic Remains'. It was a textbook of palæontology for the student, and a reference book for the 'amateur collectors' of fossil remains, who were now numerous, since rock-hunting had become fashionable; and it was said that the King of Saxony, on a visit to England, was seen searching for fossils with a copy of 'Medals' in one hand and a geological hammer in the other. The work was in two volumes, contained 930 pages and was profusely illustrated with figures of fossils. Volume 1 has on its title page an illustration of the fossil *Ammonites mantelli*, named after Mantell by James Sowerby in 1812. Volume 2 has as its frontispiece an illustration of a fossil fish, the *Osmeroides mantelli*, named after Mantell by Professor Louis Agassiz.

Mantell was among three hundred members of the Royal College of Surgeons of England and others who were elected to Honorary Fellowship when this was first instituted in 1843, although he and many others had already self-designated themselves 'Fellow' for many years.

On September 3, 1844 Mantell moved from Clapham into a house which he described as being near the Queen's palace and Belgrave Square. The house, 19 Chester Square, is extant today, but what Mantell described as 'a small, very pleasant and convenient house' in 'Pimlico' has now six storeys and is in Belgravia! His household now consisted of his son Reginald, apprenticed to I K Brunel; his sister, Mrs West; two female servants; a footman; and his medical assistant. During the whole time he lived in Chester Square he was a martyr to pains which came on 'daily almost hourly', and he said that he was 'frantic with pain' for from '14 to 16 hours out of the 24'. Despite his physical sufferings he struggled on, continuing to visit patients in what was now a fashionable West End practice, and at the same time he carried out geological investigations in the Isle of Wight. In 1847 he published the result of his researches in the island in a book entitled 'Geological Excursions around the Isle of Wight', which he dedicated to the Prince Consort, 'a brother of the hammer'. In 1851 he published his last book 'Petrifactions and their Teachings, or a Hand-Book to the Gallery of Organic Remains of the British Museum'. In the preface he reminds the reader that 'this volume like its predecessors has been composed during the brief and uncertain intervals of arduous professional duties', and there seems no doubt that publication of this work was unavoidably postponed 'by the long and severe indisposition of the author'. Since some 20,000 to 30,000 of Mantell's specimens had found their way into the British Museum, Mantell was well fitted to write an explanatory catalogue of the exhibits.

A narrative of Mantell's last years is 'full of melancholy interest' as 'the shadows of life' began to creep over this 'frank, manly, generous nature'. With so many of his hopes blighted, this 'lovable old man', 'dear Dr Mantell', wrote to his friend the Reverend Dr John Fleming, the Scottish naturalist, telling him of all his troubles, just as he used to open his heart to Professor Silliman in his letters.

On October 11, 1841 Mantell was involved in a carriage accident. A fortnight later he developed paralysis of his lower limbs, but this cleared up within a few weeks and he was soon back at work. Pains in the back and limbs, however, persisted and grew in intensity, while the intervals of freedom from pain grew shorter and shorter.

His whole attitude to life changed, and he became morose and dispirited. 'Never was a human being', he said, 'more dependent for happiness on domestic affection than myself – and scarcely one to whom it has been more denied'. Despite his sufferings he still carried on his daily rounds, but his trustworthy assistant must have borne the greater burden of the practice. His features now revealed the extent of his sufferings, and his body was bent and twisted as a consequence of a lateral curvature of the spine. A host of eminent surgeons, and physicians too, whom he had consulted, had advised him to rest, and give up his practice, but he said he could not afford to do so. His income, he said, did not cover one quarter of his expenses, and he was drawing on his capital.

In 1845 he started taking opium, at first laudanum in pharmaceutical doses, and then *Liquor Opii Sedativus*, but the doses were gradually increased until, in March 1852, he was able to swallow one ounce of *Liq. Opii Sed.*, thirty-two times the maximum dose! He had tried inhaling ether and chloroform to alleviate his pain, but not only did they not do so but they made him violently sick and gave him severe headaches.

On April 2, 1852 he was elected president of the West London Medico-Chirurgical Society, but he did not live to complete his year of office. News of his necessitous condition must have been brought to the notice of the Government, probably through Earl Rosse, the president of the Royal Society, for in the summer of 1852 he received the news that Queen Victoria had awarded him a civil list pension of £100 *per annum*. He was much gratified by the honour, but said he wished it had been £200 for then he could have given up his practice and retired to a cheaper locality.

At the beginning of November 1852, suffering so badly from pains in his lower limbs that he had not slept properly for a week, he insisted on keeping a lecture engagement at Clapham, though he felt dreadfully ill and looked it. The audience was shocked at the sight of his emaciated face and his contorted body. He was so weak that he had to be supported by his nephew Alfred Woodhouse and his footman, and he delivered his lecture whilst seated. On the following day, November 9, he was unable to do his rounds and remained in his study all day. That night he took an opiate and slept. In the morning he lapsed into unconsciousness, and died on the afternoon of November 10, 1852, at the age of 62.

Mr William Adams, the orthopaedic surgeon, and Dr Thomas Hodgkin performed a post-mortem examination. The cause of death as entered by the coroner on the death certificate reads as follows: 'Opium taken medicinally to

relieve pain but proving fatal from the weak state of deceased.' The post-mortem findings included extreme lateral curvature of the lumbar spine, and advanced osteoarthritic changes in the vertebrae.

He was buried at Norwood Cemetery beside his 'departed angel', his much beloved daughter Hannah Matilda.

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The Development of the Hospitals in Brighton and Hove

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Eleven hospitals in the combined towns of Brighton and Hove were taken over when the National Health Service started in 1948 (Table 1). Of these, three were general and the rest special hospitals, and it is the purpose of this paper to review how these various institutions came into being and developed.

In the early eighteenth century Brighton was a poor fishing village and in 1740 the population was said to be about 1,000. In winter the town was almost completely cut off except by sea.

It was in the eighteenth century that sea bathing became popular as a medical treatment although it had started in the seventeenth century. In 1753 Dr Richard Russell, a physician of Lewes, decided to move to Brighton to give his patients the benefit of the sea-water cure. The life and writings of Dr Russell are well known and it was through him more than any other that Brighton developed as a great watering-place and centre of fashion and played an important part in the history of the country. Russell died in 1759 and his practice passed mainly to a Dr Relham, who wrote 'A short history of Brighthelmstone with remarks on its air and analysis of its waters'. Dr John Awsiter was the third most famous Brighton doctor and in 1768 published a pamphlet 'Thoughts on Brighthelmstone concerning sea bathing and drinking sea-water with some directions for their use'. The special contribution of Awsiter was indoor sea bathing. All three advocated the use of sea-water internally and externally together with other remedies and also

Table 1

Dates of establishment of the eleven hospitals in Brighton and Hove taken over by the National Health Service in 1948

General hospitals	Date	
Royal Sussex County Hospital	1828	} Originated in Brighthelmstone Dispensary founded 1809
Hove General Hospital	1859	
Brighton General Hospital	1866	
Special hospitals		
Sussex Maternity Hospital	1831	} Originated in Lewes Road Dispensary, founded 1899
Sussex Eye Hospital	1832	
Royal Alexandra Hospital for Sick Children	1868	
Sussex Throat and Ear Hospital	1878	
Foredown Hospital for Infectious Diseases	1886	
Bevendean Hospital (Sanatorium)	1898	
Lady Chichester Hospital for Women and Children	1905	
New Sussex Hospital for Women and Children	1912	