

Charles Darwin and the Dentists

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Charles Darwin suffered relapsing, debilitating illness for most of his adult life with many symptoms. His most prominent complaints were episodic nausea, retching and vomiting. As is common in patients with repeated vomiting he developed dental problems, problems that may be dated back to his voyage on the Beagle and his vomiting due to persistent seasickness. Dental problems continued after the voyage and he was one of the first patients to have extractions under chloroform.

Watching a dental procedure caused Darwin great distress, much as surgical and obstetric procedures had previously caused him distress with onset of symptoms. Darwin's dental experiences are consistent with the proposed diagnosis of his lifetime illness— patients with similar illnesses today have much the same dental problems.

Dentists also helped Darwin with his researches and collection of specimens. In Darwin's day, dentists, like country clergymen, had time to follow other interests. Dentists contributed to Darwin's dental health, to the dental health of his family and to Darwin's work and biological studies. Dentists, in their own right, were also prominent in developing our biological understanding.

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Background

Darwin's Illness – a selected history

The first symptoms of Darwin's illness appeared when he was a young man; they progressed as he grew older but then became less severe in old age. Some evidence of Darwin's illness was present when he was a medical student in Edinburgh. His family knew that he had 'a weak stomach' and that any unpleasant news from home would 'cause him to lose a great many breakfasts'.¹ In Edinburgh he was unable to watch surgical operations because of what was probably intense nausea if not actual vomiting.²

Medical learning was abandoned and studies at Cambridge followed. There Darwin suffered from eczema of the lips and hands and had at least two periods of intense lethargy.^{2,3} He developed an intense interest in geology and biology, as well as his formal studies, and despite these then minor problems. These led, after graduation, to his selection as naturalist on HMS *Beagle*. The voyage, originally planned for three years was to last five years and to take them around the world with many ports of call in South America, Australia, the Pacific and South Africa.⁴ During the voyage Darwin kept notebooks in which he recorded much information, including some trivial details. 24 of these notebooks as well as hundreds of his letters survive today.⁵

Before sailing Darwin suffered from 'palpitations and pain around the heart'; symptoms that he kept to himself. During the five years away Darwin suffered from several episodes of illness when ashore, including headache, and persistent seasickness.⁴ The seasickness commenced when the vessel left Plymouth and was present whenever the *Beagle* was at sea– even when on-board the *Beagle* in harbour. This was not normal seasickness, but rather than improving the illness worsened as the voyage progressed.⁶

After the voyage his illness became progressively more severe; in particular he suffered increasingly from episodic nausea, retching and vomiting. Unlike bulimia, the vomiting occurred hours after eating, often waking him from sleep at night.⁷

Darwin was distressed when he was with his wife during the birth of their first child, William, and was ill for days after the event.⁸ Again, when his second son, George, had an anaesthetic to have teeth removed, Charles was again ill: 'It is strange how immediately any mental excitement upsets & utterly prostrate; seeing George chloroformed for his teeth brought on my eternal sickness for 24 hours'.⁹

Other symptoms also appeared; in later life he suffered from incidents of memory loss and partial paralysis consistent with so-called 'stroke-like' episodes.¹⁰ Darwin's illness has been described in more detail elsewhere.¹¹ (open access paper.)

Darwin's Diagnoses

More than 40 different and very differing diagnoses have been proposed for Darwin's illness. The late Jared Goldstein summarized these diagnoses succinctly: 'Cycles of psychogenic and organic diagnostic labels have come and gone... Take your pick, there's something for everybody: hypochondriasis, refractive error, depression, arsenic poisoning, Oedipal complex, pigeon allergy, familial psychosis, chronic brucellosis, chronic anxiety, Chagas' disease, and more'.¹²

Added to these proposals may be a diagnosis by Darwin's fourth son, Leonard, which was that his father suffered from pyorrhoea resulting in auto-poisoning and subsequent general symptoms. Leonard was an army engineer officer, later a scientist. He modestly recorded that it was 'very rash for a layman to speak on such subjects'.¹³ Darwin's dental problems were a sequel rather than the cause of his illness. Alternate practitioners have also had their say – one proposal is that Darwin suffered from mercury poisoning from dental amalgam.¹⁴

Darwin certainly had symptoms of some of the proposed diagnoses – lactose intolerance,¹⁵ irritable bowel syndrome,¹⁶ acute panic disorder¹⁷ and atopic dermatitis.¹⁸ These diagnoses, however, account for only some of the symptoms of the illness and not the full spectrum of the disorder. Many of Darwin's symptoms, including his seasickness, are those that occur in patients with cyclic vomiting,¹⁹ but this in itself is an inadequate diagnosis.

None of these previously proposed diagnoses consider Darwin's family history and it is this history, particularly his maternal family history that may be the key to the true nature of his lifetime illness.

A diagnosis of adult onset mitochondrial disease due to a maternally inherited pathological mitochondrial DNA mutation explains Darwin's cyclic vomiting; it also explains his 'stroke-like' attacks in later life, it explains the strange chronic illness of Darwin's elder brother Erasmus, the chronic illness and death of their mother Susannah, her Wedgwood siblings and in turn their mother, Sarah (Charles' maternal grandmother).²⁰ The youngest sibling of the mother's generation, Mary-Ann, died at the age of eight with a condition that had the features of the MELAS syndrome, a recognised mtDNA disorder.²¹

Darwin's Dental Problems

The first record found of Darwin's contact with dentists appears inside the cover of Darwin's first *Beagle* notebook (1832).²² Darwin's scribbled notes on reaching Buenos Ayres are the traveller's rough memoranda for necessities whilst in reach of civilization; things to be bought; and three times he reminds himself of his need for a dentist: *Hargrave Paper, Bramah pens, scizzors, watch key and glass, Dentist, watch mended—Notebooks—spurs. ... The very next door to Mr. Griffiths a French dentist—Cigars: Dentist Mr Griffiths Calle (street) de Florida.* Later in the notebook labelled 'Buenos Ayres. St. Fe and Parana Cordillera of Chili' (page 5a) is written 'denture mended'. Clearly, in September 1833 Darwin already had noteworthy dental problems.

Inside the cover of his notebook labelled "Sydney" Darwin has written "Dr Jennerett Rtt St". On page 4b of the same notebook there appears also the one word 'dentist'. The reference is to Dr Henry Jeanneret MD, LRCS who practised dental surgery in Murray Street, Hobart (Tasmania) adjacent to Montpellier Retreat, to which 'Rtt St' may refer



Figure 1. Dr. Henry Jeanneret MD, MRCS (1802-1896) dentist, medical practitioner and botanist of Hobart and Sydney. (photo WikiTree, with the kind permission of Mr Colin Jenneret, Lindisfarne, Tasmania.)

(Fig. 1).²³ Jeanneret was also a naturalist and had been president of the Plinian Society in Edinburgh. Darwin may well have had natural history discussion as well as dental consultation with Dr Jeanneret during the 12 days the *Beagle* was anchored in the port of Hobart (5-17 Feb 1836). Jeanneret sent many specimens to Darwin's friend and colleague, Joseph Hooker, curator of the Royal Botanic Gardens, Kew and a genus of seaweed is named after him (Table 1).

Charles Darwin and the Dentists

Table 1. Darwin's dental practitioners and correspondents, arranged in alphabetical order.
CD refers to Charles Darwin.

1. Bate, Charles Spence (1819-1889) FRS. Practiced dentistry in Swansea, then in Plymouth.
2. Bell, Thomas Hornsey (1792-1880) FRS, FLS. Surgeon-dentist, New Broad Street, London. Professor of Zoology King's College, London. Contributed the Reptiles sections to *The Zoology of the Voyage of HMS Beagle* (41).
3. Bridgman, William Kencely (1812-84). Dentist and naturalist, practiced in Norwich. Corresponded with CD (42). Studied fertilization of ferns, flowers under the microscope.
4. Choice, Felix (1829-1915). Surgeon-dentist, London. Corresponded with CD in relation to tears being a sign of happiness, as discussed in *Expression of Emotions ...* (43).
5. Gilbert, Henry (practiced 1850's) Dentist at Pall Mall, London, pigeon fancier. Designed chair for dental extractions. Sent CD 'as a present two young Runts (a breed of pigeon) one a fine young Cock' (44).
6. Jeanneret, Henry (1802-86). MD, LRCS. Apprentice surgeon Oxford, studied medicine at Oxford, Paris, Edinburgh, graduated MD 1824. President of Plinian Society Edinburgh 1829. Migrated to Sydney 1829, published the first Australian text on dentistry in 1832. Married, transferred his practice to Hobart 1834. Relinquished practice, appointed to the penal colony at Port Arthur, later administrator Aboriginal settlement, Flinders Island. Returned Sydney 1850 and to London 1851. Sent many specimens from Tasmania to Joseph Hooker. A genus of seaweed, *Jeanneretia*, was named by Hooker and Harvey (William Harvey, an Irish botanist) after him.
7. Nasmyth, Alexander (1789-1848). FRCS, FLS. Surgeon-dentist and anatomist, Hanover

Darwin's dental problems persisted after the voyage. He married in 1839 and his wife Emma catered for his liking for sweet things, in particular custard puddings.²⁴ This, and his repeated vomiting would have made dental decay inevitable.²⁵ He consulted with several London dentists, clearly the leading London dentists. Among these was James Robinson, surgeon-dentist to Prince Albert, founder

and first president of the College of Dentists. Darwin and his wife Emma were patients, as was Joseph Hooker. In a letter to Hooker, Darwin spoke of 'Robinophobia'.²⁶

George Waite was the son of John Waite, Surgeon-Dentist to King George IV. On the death of his father he succeeded to this practice and was clearly involved with more difficult dental tasks. In a

Square, London. Surgeon dentist to Prince Albert and Queen Victoria. Known for his work on the anatomy of the tooth. Like CD and others, he quarreled with Richard Owen (45).

8. Nasmyth, Robert (1792- 1870). FRCSE. Scottish surgeon-dentist and dentist to Queen Victoria in Scotland. Founded the Edinburgh Dental Dispensary.

9. Robinson, James (1813-62). Dentist at Gower St, London. Surgeon-dentist to Prince Albert. First president of the College of Dentists. CD and Emma were patients, as was Darwin's friend and colleague, Joseph Hooker. In a letter to Hooker, Darwin spoke of 'Robinophobia' (26). Pioneer in the use of ether as an anesthetic.

10. Tomes, Sir Charles Sissmore FRCS, FRS (1846-1928). Younger son of the dental surgeon John Tomes. Curator of the Odontological Society Museum, 1874-80, and compiled its first catalogue. Wrote the Manual of dental anatomy, human and comparative (1876), and edited and enlarged John Tomes's System of dental surgery. Published a series of papers on the structure and development of the teeth in the Reptilia, Ophidia, and Pisces, as well as one on the enamel organ of the armadillo (46). Corresponded with CD on matters relating to inherited dental abnormalities and the enamel organ (47) .

11. Waite, George Derby MRCS (1804-80). Surgeon-dentist; extracted CD's molars under chloroform. Published influential dental texts, including the surgeon-dentist's anatomical and physiological manual (1826, 9 editions). At one time president of the College of Dentists.

12. Whatford, William Starr (1795-1887). Dentist to the Brighton and Hove Dispensary. Source of anecdote about dog visiting dentist (38).

13. Woodhouse, Alfred James (1824-1906). Dentist Hanover Square, London. Darwin family dentist. CD wrote to him asking about inheritance of peculiarities of deciduous ('milk') teeth (40).

letter to his cousin, the Rev. William Fox, in October 1852 Darwin writes: '... what a blessed discovery is Chloroform: when one thinks of one's children, it makes quite a little difference in ones happiness. The other day I had 5 grinders (molars)(two by the Elevator) out at a sitting under this wonderful substance, & felt hardly anything'.²⁷ Darwin's entry in his Health diary (transcribed by Colp)²⁸ indicates

that the extraction took place on 24 June and his account book shows that 'Mr Waite. Dentist' was paid £1.1s on the 5 September of that year. Darwin did have conservative work performed. In a letter to his son William in February 1862 he concluded with: 'On Wednesday I have another lark to London to a Dentist, & be hanged to it, though it is only for stopping' (filling).²⁹



Figure 2. Dr. Thomas Hornsey Bell FRS, FLS (1792-1880) Surgeon-dentist, London. Professor of Zoology, King's College, London. (photo: Wikimedia Commons, public domain.)

Chloroform was first used as an anesthetic, first on himself and then on obstetric patients by James Simpson in 1847,³⁰ so Darwin's account must be one of the first by a dental patient experiencing this form of anesthesia. Darwin later observed his son George's teeth extracted under chloroform. Unlike his own episode, witnessing (rather than experiencing) an extraction brought on his recurrent illness. (William Morton, a dentist, had previously used ether for a dental and a later surgical procedure in 1846.³¹)

Alfred James Woodhouse, of Hanover Square, London, was the Darwin family dentist. Emma and Henrietta Darwin visited him in May 1861³² and Darwin's account book (Down House MS) shows a number of payments to him in that year. It may have been Woodhouse who suggested that Darwin send a sample of gastric vomit for analysis to John Goodsir. This analysis showed acidity with yeast-like organisms but no pathogens.³³

Goodsir was Professor of Anatomy at Edinburgh University, who studied cell structure and had formerly been apprenticed to the dentist Robert Nasmyth. From studies dating back to this apprenticeship he made the important observation that deciduous teeth were not the 'parents' of permanent teeth but developed independently. In 1839 he published a noted paper on this topic.³⁴

Darwin also consulted leading London clinicians of his time. These included Dr John Chapman, who specialised in treating complaints with ice-bags placed along the spine.³⁵ In a scribbled memorandum prepared for Chapman's visit to Down Darwin notes: 'What I vomit intensely acid, slimy (sometimes bitter) corrodes teeth'.³⁶ Darwin never knew the fundamental cause of his disease but he recognised one cause of his dental problems.

Dental Correspondents and Collaborators

Apart from dentistry, dentists sent specimens to Darwin and assisted with his observations. Some dental contemporaries were noted contributors to natural history in their own right. One of the first was Thomas Bell who was a dentist and an

established naturalist (Fig. 2). In addition to his dental practice he was professor of Zoology at King's College, London. He was involved with classification of the reptiles collected during the Beagle voyage and wrote the reptile section of the Zoology of the Voyage of H.M.S. Beagle.³⁷ An Australian goanna, or monitor, was named after him but was later changed due to precedence to *Varanus varius*. However, a variety of that species retains the name of Bell's monitor. Five species of lizards and two turtles, not relating to the Beagle voyage, are also named after him. 1838 Bell wrote to Darwin congratulating him on his impending marriage.³⁸

Charles Spence Bate (Fig 3.) was an authority on the Crustacea, a subphylum that includes barnacles (Cirripedia). Darwin spent seven years studying and classifying these marine arthropods and Bate was one of his most prolific correspondents (Fig. 2). In 1853 Darwin included in a letter '*I feel much obliged for your never-tiring exertions in obliging me. The last specimen has been quite satisfactory. Verruca [Verruca stroemia— the 'wart barnacle'] acts on the rock in two ways, round the margin & under the middle of the basis: this latter action was unequivocally plain, & suffices in my mind, with all the previous facts known to me, to prove that Verruca acts only on calcareous substances.*' Earlier that year Darwin had ended a letter to Bate with the words '*I hope that your professional engagements allow you time to continue your Natural History pursuits.*'³⁹ Darwin used Bate's figures of the spermatozoa and larval stages of *Balanus balanoides* and *Verruca strömia* for *Living Cirripedia* (1854).

When Darwin was writing "*The Expressions of Emotions ...*" Bate sent him the quaint (and possibly unlikely) anecdote of a dog, who had previously had one tooth extracted by a dental surgeon, spontaneously returning and sitting in the dental chair when symptoms returned.⁴⁰ The story did not appear in the publication.⁴¹ 'The dog had been suffering from toothache. & Mr Whatford put the dog up in his operating chair & took out the tooth— Some time after the same dog had toothache again & he left the man servant with whom he was & came in at the door of Mr Whatfords house & went into the room & got into the operating chair & of his



Figure 3. Charles Spence Bate LDS RCS, FRS, FLS (1819-1889) Practiced dentistry in Swansea, then in Plymouth, England. An authority on the Crustacia. (photo: Picture Library, The Royal Society, London.)

own accord had another tooth out. This surpasses the moral courage of many persons—'

When writing "The Descent of Man" Darwin wrote to Alfred Woodhouse, the family dentist, asking whether any peculiarities of any kind in the milk-teeth of man are inherited, and, in the same letter, asking: 'On average or occasionally are canine teeth larger in Man, than in woman?'.⁴² Poor Woodhouse— if he did not know the answers he was instructed to enquire at next meeting of the Dental Institution to ask "any old & accurate practitioner". In the *Descent* the following appears: "With many animals the canine teeth in the upper or lower jaw, or in both, are much larger in the males than in the females; or are absent in the latter..."

Conclusions

Charles Darwin's dental problems were exacerbated by his illness with recurrent vomiting but dentists helped maintain his dental health and the dental health of his family. Seeing, rather than experiencing a dental procedure brought on an episode of Darwin's chronic illness – an unusual but characteristic feature of this, his lifetime complaint. Apart from dentistry, dentists provided material for Darwin's study and research and some contributed directly to our understanding of the natural world.

Mitochondrial dysfunction should be considered in any patient with recurrent vomiting, especially if there are other symptoms such as episodic headache or lethargy.

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J van Wyhe is founder and director of *The Complete Work of Charles Darwin Online* (darwin-online.org.uk), a resource that has provided much material for this paper and for the original thesis on Darwin's Illness.

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