

Huth EJ (2006). Benjamin Franklin's (1706-1790) place in the history of medicine.



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There was hardly a field of human endeavour that the 18th-century American printer, author, diplomat and scientist, Benjamin Franklin, worked in without some benefit to those who came after him. Medicine was no exception as a field of his endeavour. He understood the importance of judging the effects of treatments and recognised placebo effects. His practical bents were reflected in his design of an urethral catheter and of bifocal spectacles. He supported smallpox inoculation when it was denounced by many physicians, and his data on mortality from smallpox inoculation ([Franklin 1759a](#)) supported the earlier conclusions of [Jurin \(1724\)](#), [Nettleton \(1724\)](#), and [Scheuchzer \(1729\)](#) that mortality from inoculation was much lower than that with naturally-acquired smallpox ([Huth 2005](#)). These contributions may well pale in importance beside his other accomplishments in science but they do show a man who could think beyond the orthodoxies of his time.

Cite as:

Huth EJ (2006). Benjamin Franklin's (1706-1790) place in the history of medicine. JLL Bulletin: Commentaries on the history of treatment evaluation (www.jameslindlibrary.org).

Franklin has become one of the most written-about Americans of the early American past, not only because of his contributions in science but also because of the service he gave to his new nation, the United States, at its birth. Detailed accounts of his prolific life are readily found in many libraries, both academic and public (Becker 1958; Cohen 1972; Lemay 1999; Isaacson 2003; Lemay 2004). The recently published biography by Chaplin (2006) is especially useful for its concentration on Franklin's scientific interests and activities. An online biography is available at the Wikipedia website ([Wikipedia 2006a](#)). His place in medicine has been reviewed in two recently published papers (Gensel 2005; Hirschmann 2005) and in an extended monographic account by Finger (2006). Franklin's own voice is well represented in the multivolume encyclopaedic collection of his papers published by the Yale University Press (*The Papers of Benjamin Franklin* 1959-), and in a shorter collection that includes his *Autobiography* (Benjamin Franklin 1987). But what was his contribution to the history of medicine in general and therapeutic evaluation in particular?

Boston

Franklin's father, Josiah Franklin, and his first wife, Anne, left England in 1683 and settled in Boston, where Josiah set up a shop for producing soap and candles from animal fats. Anne died shortly after giving birth to a son in 1689, and Josiah then married Abiah Folger later that year. Josiah's and Abiah's union led to seven children born before Benjamin, who was born on 17 January 1706 [in today's Gregorian calendar; 6 January 1705 in the then-current Julian calendar]. Josiah had planned that Benjamin should attend Harvard College, with a view to his entering the ministry, and so he enrolled him in the Boston Latin School as an appropriate preparation for this. When actually faced with the cost of education at Harvard, however, Josiah had to change his mind.

Benjamin worked briefly in his father's shop before becoming indentured with his older brother James, who had prepared to become a printer in Boston before the family had left England. Benjamin's penchant for, and skill in, writing surfaced not long after his brother James launched a newspaper, *The Courant*. Benjamin began to write satirical articles behind the pseudonym Silence Dogood and surreptitiously got them published in his brother's newspaper. After they quarrelled over the indenture agreement, however, Benjamin fled by ship for New York and wound up in Philadelphia in 1723. It was there that his commercial success as a printer and publisher and his ascendancy in political life began.

Philadelphia

Franklin's prominence in Philadelphia grew rapidly after he opened his print shop in 1728. A year later he purchased *The Pennsylvania Gazette* and expanded his publishing enterprise in 1732 by launching *Poor Richard's Almanack*. In 1730 Franklin had entered a common-law marriage with Deborah Read. She had been married to a John Rogers who deserted her and left for the Caribbean, but the unresolved question of whether Rogers had died there meant that a formal marriage could have led to Deborah being charged with bigamy. Benjamin and Deborah's son, Francis, was born two years later. Tragically, 'Franky' died from smallpox when he was four years old. Franklin had been aware that inoculation had conferred protection during an epidemic of the disease in Boston, and he had intended to have his son inoculated. This had been postponed, however, because Franky had been suffering from an episode of diarrhoea. It seems likely that this tragic loss of a very young son was part of Franklin's motivation for later promoting inoculation,

in particular through his publication in 1759 of *Some Account of the Success of Inoculation for the Small-pox in England and America* ([Franklin 1759a](#); Franklin 1759b).

Franklin's printing and publishing enterprise was hugely successful and enabled him to retire from his business in 1748. During the late 1740s and early 1750s he began to engage in public and political activities, and to study electricity. The electrical studies brought him international renown, especially his famous kite-flying demonstration of the electrical nature of lightning in 1752. His electrical studies led him to try electric shock as a treatment of paralysis (Hirschmann 2005). Some of the patients he treated showed some short-lived improvement but Franklin was reluctant to attribute this to the electrical shocks. He wondered whether such responses were simply due to expectations of benefit from such treatment, postulating what has come to be called the placebo effect. In writing to John Pringle in 1757 Franklin noted that:

. . . I never knew any advantage from Electricity in Palsies that was permanent. And how far the apparent temporary Advantage might arise from the Exercise in the Patients Journey and coming daily to my house, or from the Spirits given by the Hope of Success, enabling them to exert more Strength in moving their Limbs, I will not pretend to say. (Franklin 1757).

A measure of the renown that came to Franklin as a consequence of his studies of electricity and lightning is the number of academic honours that followed. In 1753 he received honorary degrees from Harvard and Yale. The Royal Society awarded him its Copley Medal, making him its first recipient outside Great Britain, and elected him to its Fellowship in 1756. He received honorary doctorates from the universities of St. Andrews and Oxford in 1759 and 1762, respectively.

Franklin's keen judgment in civic and political matters surfaced to the benefit of American medicine in 1751 when he aided Dr Thomas Bond in a drive to raise funds to establish a hospital for the care of indigent patients and mentally-ill persons. By persuading the Pennsylvania Assembly to agree to match private donations, he and Bond were able to raise the large sum needed, and the Pennsylvania Hospital opened in 1752 (University of Pennsylvania 2006; Pennsylvania Hospital 2006). In his *Appeal for the Hospital* Franklin envisaged that it would serve not only as an institution for care of the sick, but also as a place for medical education.

... the Multitude and Variety of Cases continually treated in those infirmaries, not only render the Physicians and Surgeons who attend them, still more expert and skilful, for the Benefit of others, but afford such speedy and effectual Instruction to the young Students of both Professions, who come from different and remote Parts of the Country for Improvement, that they return with a more ample Stock of Knowledge in their Art, and become Blessings to the Neighbourhoods in which they fix their Residence. (Franklin 1751).

Franklin's involvement in establishing the hospital was pursued in parallel with his promotion of proposals for an Academy for "formal and adequate education" of "the Youth of this Province" (Franklin 1749; University of Pennsylvania Archives 2006a), and this opened in 1751. In 1765 John Morgan arranged for the Academy to provide medical education, and the Pennsylvania Hospital served as the Academy's site for teaching clinical medicine, as had been envisaged by Franklin when the Hospital was established thirteen years earlier. This separate unit was the initial form of what came to be designated The School of Medicine, University of Pennsylvania (University of Pennsylvania Archives 2006b).

Paris

The part of Franklin's activities in matters scientific which is of particular interest to users of The James Lind Library was his participation in a study of the purported therapeutic capacities of "Animal Magnetism" as practised by Mesmer and his disciples (Darnton 1968; [Wikipedia 2006b](#)). Franz Anton Mesmer (1734-1815), an Austrian physician, developed the concept of animal magnetism, an ill-defined "fluid" or "agent of nature" that "bathed the entire universe". As Darnton phrases Mesmer's concept, "Sickness . . . resulted from an 'obstacle' to the flow of the fluid throughout the body . . .". The practitioner of animal magnetism could induce "a crisis" in subjects seeking a cure, thereby removing the "obstacle" and restoring their health. Mesmer attempted to treat the blindness of a woman in Vienna; his scandalous failure forced him in 1777 to flee and he went to Paris to promote his concepts there ([Mesmer 1781](#); [Donaldson 2006](#)).

Because of political implications of the magnetisers' views, King Louis XVI of France appointed a Royal Commission in 1784 to judge the legitimacy of "Animal Magnetism, as practiced by Charles d'Eslon, a disciple of Mesmer, for its purported value as a method of cure" (Commission Royale 1784; Royal Commission 1785). Franklin was one of the members of the Commission, but even before his participation in the Commission's study, he was sceptical of the claims of cure by animal magnetism. In a letter to Sablière de la Condamine, Franklin comments thus:

As to the Animal Magnetism, so much talked of, I am totally unacquainted with it, and must doubt its Existence till I can see or feel some effect of it. None of the Cures said to be perform'd by it, have fallen under my Observation; and there being so many Disorders which cure themselves and such a Disposition in Mankind to deceive themselves and one another on these Occasions; and living long having given me frequent Opportunities of seeing certain Remedies cry'd up as curing everything and yet soon after totally laid aside as useless, I cannot but fear that the Expectation of great Advantage from the new Method of treating Diseases, will prove a Delusion. That Delusion may however in some cases be of use while it lasts. There are in every great rich City a Number of Persons who are never in health, because they are fond of Medicines and always taking them, whereby they derange the natural Functions, and hurt their Constitutions. If these People can be persuaded to forbear their Drugs in Expectation of being cured by only the Physician's Finger or an Iron Rod pointing at them, they may possibly find good effects tho' they mistake the Cause. (Franklin 1784).

The last sentence in this quotation echoes the point he made in his 1757 letter to John Pringle (Franklin 1757) quoted above: "... the Spirits given by the Hope of Success [in relief from "palsies" when treated with electrical shocks may enable] them to exert more Strength in moving their Limbs ...". Clearly, Franklin was aware of what we now call 'the placebo effect'.

The Commission carried out its studies, which included "blinding" of patients as to whether a treatment was with "animal magnetism" or not. It is possible that Franklin might have suggested testing for placebo effects, but, at present, it is not clear to what degree, if at all, the studies of the Commission were designed by Franklin.

Donaldson (2006) lists briefly the various manoeuvres used in the Commission's studies. They can be summarized as a single-blind, placebo-controlled trial, albeit a rather simple one as judged by today's standards. For a fuller account of the work of the Commission that examined animal magnetism in Paris in 1784, and of the extent to which Franklin is likely to have been involved, see the forthcoming article by Donaldson in *The James Lind Library*. In essence, the Commission's report ([Commission Royale 1784](#)), and the report from the Société Royale de Médecine published a few days later, concluded that animal magnetism was an ineffective and undesirable treatment ([Donaldson 2006](#)).

The Royal Commission's report appears to have closed out animal magnetism's potential place in French therapeutics (Darnton 1968) and, almost certainly, in the rest of Europe, although other methods dependent on suggestibility of patients, such as faith healing and hypnosis, continued. In the young United States of America, animal magnetism appears not to have had a place, but, clearly, some Americans did hear of it. One of the heroes of the American revolution against British rule of the American colonies, the Frenchman, the Marquis de Lafayette, was an ardent proponent. In a letter to Thomas Jefferson dated 6 March 1785, Charles Thomson, Secretary of the Continental Congress and a frequent correspondent with Jefferson, noted Lafayette's effort in Philadelphia to promote animal magnetism (Thomson 1785).

The report on animal magnetism gave me great satisfaction. Before I had heard of these experiments and of this report, I was greatly at a loss what to think of the matter. The Marqs. [sic] de la Lafayette had come over [from France] quite an enthusiast in favour of it. He had got a special meeting called of the philosophical society at Philadelphia and entertained them on the subject for the greater part of an evening. He informed them that he was initiated and let into the secret but was not at liberty to reveal it [I]t appeared to me surprizing [sic], that there should be a fluid pervading all nature capable of being collected and when collected of producing such wonderous [sic] effects as were mentioned The report you sent me has removed this doubt and though it has sufficiently demonstrated that Mr. Mesmer and his disciples have discovered no new property in nature yet it has itself made a very wonderful and very important discovery, namely to what degree the imagination can operate on the human frame. [Thomson's "philosophical society" was The American Philosophical Society.]

Thomson's mention in his letter of "The report on animal magnetism..." appears to refer to a document mentioned in a letter from Jefferson in Paris to Thomson, dated 11 November 1784 (Jefferson 1784).

I send you a pamphlet on the subject of animal magnetism, which has disturbed the nerves of prodigious numbers here. I believe this report will allay the evil.

Jefferson does not specifically refer to the Royal Commission's report, but in view of the letter's 1784 date, he was probably referring to the original report, dated 1784, in French, and not to the 1785 English translation. Further evidences suggesting that the "pamphlet" was the Royal Commission's report are Thomson's specific reference to "the report" and Jefferson's to "this report" as well as to "a pamphlet". Thomson's probable awareness of Franklin's reputation as an authoritative source on matters scientific would have supported Thomson's view of the conclusiveness of the document. Charles Thomson (Burnett 1935; Schlenker 1990; Schlenker 1999; Anonymous 2008) has never had the eminence in American history that Franklin and Jefferson have had, despite his importance as the Secretary of the Continental Congress, the political body that was the institutional father of the government of the new United States of America. But he knew Franklin and Jefferson well from frequent personal contact with them in his post as Secretary and from correspondence with them. He would have known of Franklin's sound judgments on scientific questions.

Later life

Aside from this 1784 episode, Franklin's active engagement in scientific studies was over by the mid-1750s. He left Philadelphia for London in 1757, having been appointed by the Pennsylvania Assembly to represent its interests in a dispute with the colony's Proprietors. Through the rest of his life Franklin was either in London (for most of the years between 1757 and 1775), or in Philadelphia, active in events leading to the American Revolution, or in Paris (1776-1785) in his efforts to win French support for the war with the British.

Franklin's interests in matters medical ran through most of his long life, but aside from his attempts to treat paralysis with electricity and his involvement in the Royal Commission's study of animal magnetism, his contributions were based on personal opinions, not systematic research, and his efforts focussed on practical devices, such as the flexible urethral catheter he developed for his brother. Franklin himself suffered from episodes of gout and, in later years, complained of urinary difficulties that were probably due to a uric acid bladder stone (Corner and Goodwin 1953). Benjamin's older brother, John, apparently suffered from bladder stone at an earlier age, and seems to have complained about difficulties in using a urethral catheter in a letter to Benjamin. This prompted Benjamin to devise a flexible catheter.

Reflecting yesterday on your Desire to have a flexible Catheter, a Thought struck into my Mind how one might possibly be made: And lest you should not readily conceive it by any Description of mine, I went immediately to the Silversmith's, and gave Directions for making one, (sitting by 'till it was finish'd), that it might be ready for this Post. (Franklin 1752a; 1752b).

A footnote to this letter in Volume 4 of *The Papers of Benjamin Franklin* (1959-) notes that Franklin did not invent this kind of catheter, which may have been devised in 1720 by Francesco Roncelli-Pardino, or even earlier.

A similar urge to relieve a problem with a practical solution led Franklin to devise for himself a pair of bifocal glasses. He may have made them as early as 1779 (Hirschmann 2005), but the first written record of his design of his bifocals is a letter to George Whatley:

I ... had formerly two Pair of Spectacles, which I shifted occasionally, as in travelling I sometimes read, and often wanted to regard the Prospects. Finding this Change troublesome, and not always sufficiently ready, I had the Glasses cut, and half of each kind associated in the same Circle By this means, as I wear my spectacles constantly, I have only to move my Eyes up or down, as I want to see distinctly far or near, the proper Glasses being always ready. (Franklin 1785).

Franklin had the capacity to pull together numerous related observations — his own and those of others — and draw a well-focussed conclusion. A good example is his view of the cause of lead-poisoning, described in a 1786 letter to Benjamin Vaughn (Franklin 1786).

. . . When I was a boy [I heard] of a Complaint from North Carolina against New England Rum, that it poison'd their People, giving them the Dry Bellyach, with a Loss of the Use of their Limbs. The Distilleries being examin'd on the Occasion, it was found that several of them used leaden Still-heads and Worms, and that the Physicians were of Opinion, that the Mischief was occasioned by the Use of Lead.

. . . In America I have often observ'd that on the Roofs of our shingled Houses, where Moss is apt to grow in northern Exposures, if there be any thing on the Roof painted with white Lead, such as Balusters, or Frames of dormany Windows, &c., there is constantly a Streak on the Shingles from such Paint down to the Eaves, on which no Moss will grow, but the wood

remains constantly clean and free from it I Have been told of a Case in Europe, I forgot the Place, where a whole Family was afflicted with what we call the Dry Bellyach, or Colica Pictonum, by drinking RainWater. It was at a Country-Seat, which being situated too high to have the Advantage of a Well, was supply'd with Water from a Tank, which received the Water from the leaded Roofs. This had been drunk several years without Mischief; but some young Trees planted near the House growing up above the Roof, and shedding their Leaves upon it, it was suppos'd that an Acid in those Leaves had corroded the Lead they cover'd and furnish'd the Water of that Year with its baneful Particles and Qualities.

When I was in Paris with Sir John Pringle in 1767, he visited La Charité, a Hospital particularly famous for the Cure of that Malady, and brought from thence a Pamphlet containing a List of the Names of Persons, specifying their Professions or Trades, who had been cured there. I had the Curiosity to examine that List, and found that all the Patients were of Trades, that some way or another, use or work in Lead; such as Plumbers, Glaziers, Painters, &c., excepting only two kinds, Stonecutters and Soldiers. These I could not reconcile to my notion, that Lead was the cause of that Disorder. But on my mentioning this Difficulty to a Physician of that Hospital, he inform'd me that the Stonecutters are constantly using melted Lead to fix the Ends of Iron Balustrades in Stone; and that the Soldiers had been employ'd by Painters, as Labourers, in Grinding of Colours. (Franklin 1786).

Franklin's views on the cause of the common cold indicate that he was sympathetic to the view that it could result from some causative agent or agents transmitted from one person to another. In writing to Benjamin Rush, the eminent Philadelphia physician best known for his strong advocacy of blood-letting, Franklin commented thus.

[I] am glad to hear that [Dr. Cullen] speaks of Catarrhs or Colds by contagion. I have long been satisfy'd from Observation, that besides the general Colds now termed Influenza's, which may possibly be spread by Contagion as well as by a particular Quality of the Air, People often catch Cold from one another when shut up together in small close Rooms, Coaches, &c. and when sitting near and conversing so as to breathe in each others Transpiration, the Disorder being in a certain State As to Dr. Cullen's Cold or Catarrh a frigore, I question whether such an one ever existed. (Franklin 1773a; 1773b).

One detail in Franklin's interest in medical matters had to do with his skin ailment. He described it on several occasions, for example:

The Scurf appears to be compos'd of extreamly thin Scales one upon another, which are white, and when rubb'd off dry, are light as Bran. When the Skin is clear'd in the Bath, it looks red, and seems a little elevated above the sound Skin that is around the Place; but it is not sore: And in a few Hours after, it becomes dry, and feels stiffned as it were with the first thin Coat of the new Scurff. . . . The fine Lamina seem to be formed one under another, and not to make an united thick Substance by adhering together. In rubbing them off they separate, like Talc, each having a Polish that shines. (Franklin 1777).

His descriptions have been judged by dermatologists of our time as consistent with a diagnosis of psoriasis. Franklin's description certainly did not establish psoriasis as a specific clinical entity in the literature of medicine, but it did pre-echo Robert Willan's classic description:

The second Order of Cutaneous Diseases includes those affections which are characterized by an appearance of scales, arising from a morbid state of the cuticle, as specified in the second definition. The cuticle is not, however, the only seat of these complaints. They often originate from indurated papulae, or larger elevations of the true skin which by pressure or distension injure the texture of the cuticle, and produce thickened, irregular layers of it. The scales or crusts, thus formed, have not always been distinguished from scabs succeeding confluent pustules, or superficial ulcerations... (Willan 1808).

Conclusion

Clearly Benjamin Franklin's most prominent place is in the history of the North American British colonies and the early United States. He remained for many years devoted to trying to develop a compromise between Britain's desires to control many aspects its colonies and the desires of the colonists south of what is now Canada for less rigid control of their affairs by the Parliament in London. For a long time Franklin eschewed calls for a violent separation of the colonies from the mother country and its monarchy, because he considered himself to be a citizen loyal to the Crown. Once he became convinced that a compromise could not be reached, however, he joined the advocates of revolution and worked with them for their goals.

What is Franklin's place in the history of medicine? He held many views that would eventually be vindicated by others, for example, the nature of psoriasis and of lead poisoning, and the aetiology of the common cold. Although he was aware of 'the placebo effect', I have not found any evidence that his comments on this influenced any 19th-century criteria for judging the effects of treatments. Even his strong advocacy of smallpox inoculation came many years after it had been advocated in Britain on the basis of analyses of numerical evidence (Huth 2005). The one consequence of Franklin's interests in medicine that had both an immediate and a long-term influence was his key roles in establishing a pioneer hospital and an Academy in Philadelphia, which ultimately became the School of Medicine and the University of Pennsylvania. But this influence was restricted to the United States; Europe already had its own facilities for education in medicine.

I conclude that Benjamin Franklin's interests in medical matters and his keen insights are best seen, not so much as influential developments in the history of medicine, but as examples of his strong curiosity about many aspects of life and how to grapple effectively with those that were problems. In brief, he was an energetic and highly productive 'polymath' who helped to change the world in many ways.

This *James Lind Library* biography has been republished in the *Journal of the Royal College of Physicians of Edinburgh* 2007;37:373-378.

Acknowledgements

I am grateful to Iain Donaldson and Ulrich Tröhler for their careful reading of a draft version of this paper and their helpful recommendations for its revision. I thank Harold P Scanlin for his recommendations of the citations relevant to the paragraphs on Thomas Jefferson and Charles Thomson at the end of the "Paris" subsection.

References

Anonymous. Charles Thomson. http://en.wikipedia.org/wiki/Charles_Thomson. Consulted 24 November 2008.

Becker CL (1958). Franklin, Benjamin. In: Johnson A, Malone D, eds. Dictionary of American Biography. Volume III, Part 2; Echols – Fraser. New York: Charles Scribner's Sons: 585-598.

Burnett EC (1935). Charles Thomson. In: Dictionary of American Biography; Volume IX, Part 2. New York: Charles Scribner's Sons, p 481-2.

Chaplin JE (2006). The First Scientific American: Benjamin Franklin and the Pursuit of Genius. New York: Basic Books.

Cohen IB (1972). Franklin, Benjamin. In: Gillispie CC, ed. Dictionary of Scientific Biography. Volume 5, Fischer to Haberlandt. New York: Charles Scribner's Sons: 129-139.

Commission Royale. Bailly A (1784). Rapport des commissaires chargés par le Roi, de l'examen du magnétisme animale. Imprimé par ordre du Roi. Paris: A Paris, de L'Imprimerie Royale.

Corner GW, Goodwin WE (1953). Benjamin Franklin's bladder stone. *Journal of the History of Medicine* VIII:359-377.

Darnton R (1968). Mesmerism and the end of the Enlightenment in France. Cambridge, Massachusetts: Harvard University Press.

Donaldson IML (2006). Mesmer's 1780 proposal for a controlled trial to test his method of treatment using 'Animal Magnetism'. The James Lind Library (www.jameslindlibrary.org).

Finger S (2006). Doctor Franklin's Medicine. Philadelphia: University of Pennsylvania Press.

Franklin B (1749). Proposals relating to the education of youth in Pennsylvania [sic]. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America. 1987, p 323-344.

- Franklin B (1751). Appeal for the Hospital. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America. 1987, p 361-367.
- Franklin B (1752a). To John Franklin, Philadelphia, December 8, 1752. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America, Yale University Press. 1987, p 446-448.
- Franklin B (1752b). Letter to John Franklin, December 8. <http://www.historycarper.com/resources/twobf2/letter13.htm>. Accessed 10 June 2006.
- Franklin B (1757). Letter to John Pringle, December 21. In W of BF, vol 7, p 298-300.
- Franklin B (1759a). Some account on the success of inoculation for the small-pox in England and America. London: W Strahan. Includes William Heberden's anonymous directions on the inoculation procedure.
- Franklin B (1759b). Preface to Dr. Heberden's pamphlet on inoculation. In: The Papers of Benjamin Franklin, Volume 8, April 1, 1758, through December 31, 1759. New Haven: Yale University Press, p 281-7.
- Franklin B (1773a). To Benjamin Rush, July 14, 1773. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America, 1987, p 883-885.
- Franklin B (1773b). Letter to Benjamin Rush, July 14. <http://www.historycarper.com/resources/twobf3/letter12.htm>. Accessed 11 June 2006.
- Franklin B (1777). Franklin's description of his ailments. In: The Papers of Benjamin Franklin. Volume 25, October 1, 1777 through February 28, 1778. New Haven: Yale University Press, 1986, p 77-80.
- Franklin B (1784). To La Sablière de la Condamine, Passy, March 19, 1784. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America, 1987, p 1091.
- Franklin B (1785). To George Whatley, May 23, 1785. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America, 1987, p 1104-1110.
- Franklin B (1786). To Benjamin Vaughn, Philadelphia, July 31, 1786. In: Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography. New York: The Library of America, 1987, p 1163-1166.
- Franklin B (1987). Benjamin Franklin: Writings, Boston and London, 1722-1726, Philadelphia, 1726-1757, London, 1757-1775, Paris, 1776-1785, Philadelphia, 1785-1790, Poor Richard's Almanack, 1733-1758, The Autobiography, Poor Richard, and Later Writings. New York: The Library of America.
- Gensel L (2005). The medical world of Benjamin Franklin. *Journal of the Royal Society of Medicine* 98:534-538.
- Hirschmann JV (2005). Benjamin Franklin and medicine. *Annals of Internal Medicine* 143:830-834.
- Huth EJ (2005). Quantitative evidence for judgments on the efficacy of inoculation for the prevention of smallpox: England and New England in the 1700s. The James Lind Library. <http://www.jameslindlibrary.org/illustrating/records/some-account-on-the-success-of-inoculation-for-the-small-pox-in/articles>
- Isaacson W (2003). Benjamin Franklin (1706-1790): An American Life. New York: Simon & Schuster.
- Jefferson T (1784). In: The Thomson Papers: 1765-1816. Collections of The New York Historical Society for the Year 1878. New York: The Society; 1879, p 196-8.
- Jurin J (1724). A letter to the learned Dr Caleb Cotesworth. *Philosophical Transactions* 32. London: W & J Innys. pp 213-217.

Lemay JAL (1999). Franklin, Benjamin (1706-1790). In: Garraty JA, Carnes MC, eds. American National Biography. Volume 8, Fishberg – Gihon. New York: Oxford University Press, p 382-395.

Lemay JAL (2004). Franklin, Benjamin (1706-1790). In: Matthews HCG, Harrison B, eds. Oxford Dictionary of National Biography. Volume 20, Flattisbury – Freston. Oxford: Oxford University Press, 2004, pp 774-783.

Mesmer FA (1781) Précis historique des faits relatifs au magnétisme animal jusques en avril 1781. Par M. Mesmer, Docteur en Médecine de la Faculté de Vienne. Ouvrage traduit de l'Allemand. A Londres [sic. false imprint, probably Paris.] p 111-114; 182.

Nettleton T (1724). A Letter from Dr. Nettleton, physician at Halifax in Yorkshire, to Dr. Whitaker, concerning the inoculation of the smallpox. Philosophical Transactions of the Royal Society of London, Volume 32, Number 370, p 35-48.

Pennsylvania Hospital (2006). http://en.wikipedia.org/wiki/Pennsylvania_Hospital. Accessed 10 June 2006.

Royal Commission. Report of Dr. Benjamin Franklin and the other commissioners, charged by the King of France, with the examination of the animal magnetism, as now practised at Paris. Translated from the French, with a Historical Introduction (by W. Godwin). London, 1785. Republished in: Tinterow MM. Foundations of Hypnosis: From Mesmer to Freud. Springfield, Illinois: Charles C Thomas, 1970, p 82-128.

Scheuchzer JG (1729). An account of the success of inoculating the small-pox in Great Britain, for the years 1727 and 1728: With a comparison between the mortality of the natural small-pox, and the miscarriages in that practice; as also some general remarks on its progress and success, since its first introduction . . . London: J. Peele.

Schlenker BS (1990). Charles Thomson: A Patriot's Pursuit. Newark, Delaware: University of Delaware Press, p 198.

Schlenker BS (1999). Charles Thomson. In: American National Biography; Volume 21. New York: Oxford University Press, p 592-593.

The Papers of Benjamin Franklin (1959-). Volumes 1- . New Haven: Yale University Press.

Thomson C (1785). In: The Papers of Thomas Jefferson. Volume 8, 25 Feb - 31 Oct 1785. Princeton: Princeton University Press, 1953, p 15-17.

University of Pennsylvania (2006). <http://www.uphs.upenn.edu/paharc/features/creation.html>. Accessed 10 June 2006.

University of Pennsylvania Archives (2006a). <http://www.archives.upenn.edu/histy/features/1700s/medsch.html>. Accessed 10 June 2006.

University of Pennsylvania Archives (2006b). http://www.archives.upenn.edu/histy/features/1700s/acad_curric.html. Accessed 10 June 2006.

Wikipedia (2006a). http://en.wikipedia.org/wiki/Benjamin_Franklin. Accessed 10 June 2006.

Wikipedia (2006b). http://en.wikipedia.org/wiki/Franz_Mesmer. Accessed 19 July 2006.

Willan R (1808). Psoriasis. In: Shelley WB, Crissey JTeds. Classics in clinical dermatology. Springfield, Illinois: Charles C Thomas, 1953, p 10-14.

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