

# Benjamin Rush, MD: assassin or beloved healer?

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Benjamin Rush, MD (1745–1813), was not only the most well known physician in 18th-century America, he was also a patriot, philosopher, author, lecturer, fervent evangelist, politician, and dedicated social reformer. He was unshakable in his convictions, as well as self-righteous, caustic, satirical, humorless, and polemical. Unquestionably brilliant, he graduated from what later became Princeton University at age 14. He translated Hippocrates' *Aphorisms* from the Greek at age 17. He wrote the first textbook of chemistry to be published in America. He was by all accounts a devoted, if highly paternalistic, medical practitioner, who cared deeply for his patients' welfare. His principles or theories and his championship of extreme purging and bleeding ("depletion therapy") have engendered 200 years of controversy and debate that continue today. The contradiction in his character is particularly well illustrated by his behavior during the Philadelphia yellow fever epidemic of 1793, as is briefly examined in this essay.

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## BIOGRAPHICAL SNAPSHOT

Benjamin Rush was born December 24, 1745, in Byberry, Pennsylvania, near Philadelphia. He was the fourth of 7 children. His father, John, a farmer and gunsmith, died when Rush was 6. His mother supported the family by running a grocery store in Philadelphia. Rush had a devout, evangelistic, Presbyterian upbringing. He attended West Nottingham Academy in Rising Sun, Maryland, for 5 years, and in 1759 he was admitted to the College of New Jersey (now Princeton University), from which he graduated in 1760 at age 14, the youngest graduate ever (1).

In 1761, he decided on a career in medicine, and he was apprenticed to Dr. John Redman of Philadelphia. Rush was also a student of Drs. John Morgan and William Shippen, Jr., at the College of Philadelphia, where the first medical school in the colonies was established in 1765. In 1766, Rush went to the University of Edinburgh, where he received a medical degree 2 years later. It has been said that the costs of Rush's medical education were borne by Benjamin Franklin, who groomed Rush for the position of professor of chemistry at the College of Philadelphia. In any event, after a brief apprenticeship in London and a tour of medical facilities in Paris, Rush returned to Philadelphia and was appointed to that professorship in 1769. With Rush's appointment, the Philadelphia Medical School faculty consisted of Drs. Thomas Bond, Alex Kuhn, John Morgan, Benjamin Rush, and William Shippen, Jr., and was considered complete (2). The College of Philadelphia Medical School later merged with the University of Pennsylvania Medical School, a story in itself. Rush

was appointed to additional prestigious professorships at that school, further expanding his influence.

Rush wrote the first American chemistry textbook, one of the first of his 85 significant publications. It has been estimated that during his nearly 45-year career Rush taught 3000 medical students. In his 1929 *History of the Medical Department of the United States Army*, P. M. Ashburn commented on Rush's influence on American medicine:

By virtue of his social and professional prominence, his position as teacher and his facile pen Benjamin Rush had more influence upon American medicine and was more potent in propagation and long perpetuation of medical errors than any man of his day. To him, more than any other man in America, was due the great vogue of vomits, purging, and especially of bleeding, salivation and blistering, which blackened the record of medicine and afflicted the sick almost to the time of the Civil War (3).

When the 24-year-old Rush had returned to Philadelphia from Europe in 1769, he had set about developing a medical practice, which was at first a slow process. Initially, he spent much of his time taking care of the poor in Philadelphia for little or no remuneration. He was, however, well educated, a brilliant conversationalist, and well connected to prominent Philadelphia citizens. His fame grew as a result of his teaching, lecturing, publications, and influential friends. By the early 1770s, he had developed a busy and lucrative practice among the well-to-do, although he continued to take care of some of his indigent patients. In the beginning Rush was probably a rather conventional practitioner for the time. He was probably a sensitive, caring, concerned physician, who sometimes helped and usually comforted his patients. His writings reflect a strongly paternalistic view of the physician-patient relationship (4).

Rush married Julia Stockton, age 16, in 1776. They had 13 children (2).

Rush was an enthusiastic and outspoken patriot and politician, signing the Declaration of Independence and participating in the Constitutional Congress in Pennsylvania. In April 1777, Rush was appointed physician in chief of the military hospital of the Middle Department of the Continental Army. His erstwhile colleague John Shippen, Jr., was surgeon general. On December

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26, 1777, Rush wrote a polemic to George Washington detailing many problems in the treatment of casualties in the army. Rush accused Shippen of neglect of duty and maladministration (5). These and other charges led to Shippen's court martial and dismissal, although Congress later cleared him of wrongdoing. In January 1778, Rush wrote an "anonymous" letter to Patrick Henry in which he questioned Washington's military and administrative competence (6). Henry promptly forwarded the letter to Washington, who experienced no difficulty in recognizing Rush's hand. Washington accused Rush of disloyalty but allowed him to resign instead of court-martialing him.

Rush held strong beliefs on almost every important topic of his day. He was a prolific letter writer and essayist. His dogmatic, uncompromising, and sometimes satirical style made him many enemies. He championed many causes, not all of them popular, including the abolition of slavery, prison reform, and education of women (7). His politics were republican, and he was outspokenly, even viciously, critical of the Federalists, such as Alexander Hamilton, who held sway in Philadelphia.

Rush's controversial practices during the Philadelphia yellow fever epidemics in 1793, 1794, and 1797, together with his vociferous attacks on those who disagreed with him and his espousal of unpopular causes, led to his resignation from the Philadelphia College of Physicians in 1793. Eventually, Rush's reputation and practice were destroyed. President John Adams took pity on Rush and in 1797 appointed him treasurer of the mint, a position he held until his death (8). Rush continued on the faculty of the University of Pennsylvania School of Medicine. He was an immensely popular lecturer, and he continued to publish internationally respected works in general medicine and psychiatry until the time of his death.

Rush died April 19, 1813, of "typhus," which in those days was a rather generic term applied to a variety of febrile diseases. From the description provided in his obituary published in *The New England Journal of Medicine*, chest pain and dyspnea were prominent features of his terminal illness, which may have been pneumonia (9). His public reputation had recovered in the years since the turn of the century, and his death was regarded as a civic calamity in Philadelphia.

Benjamin Rush was a uniquely complex person, awesome in his vitality, productivity, and involvement in every important facet of his society. He was very much a product of his time, which had seen the "great awakening" of evangelistic, revivalist, anti-intellectual religious zeal; the rationalist "age of enlightenment," the post-Baconian view of nature as an adversary to be conquered and subdued; and in medicine, a passion for nosology, or systematically classifying all diseases. Oliver Wendell Holmes may have described Rush best: "His mind was in a perpetual state of exaltation produced by the stirring scenes in which he had taken part" (10). Such a state could not encourage sound, calm observation or thought. According to Holmes, Rush "was observing, rather than a sound observer, eminently observing, curious, even about all manner of things. But he could not help feeling that Nature had been a good deal shaken by the Declaration of Independence, and that American [medical] art was getting to be rather too much for her—especially as illustrated in his own practice" (10). Rush firmly believed that health and disease were different in America than in Europe and required a

unique approach. He also believed that God would provide a cure for every malady, if the practitioner patiently sought it out or was chosen to receive it (11). He came to believe that Divine Providence had singled him out to accomplish his heavenly purpose in Philadelphia (12).

### PHILADELPHIA IN 1793

In 1793, Philadelphia was the national capital and a cosmopolitan center of learning and culture. If nearby suburbs were included, it was the largest city in the USA. It was a very busy seaport with a thriving international trade. The city was characterized by a kind of chronic postwar euphoria, pride, and a sense of invincibility. Despite the filthy streets and wharves and inadequate public sanitation, the average life expectancy of the citizens had increased significantly (13).

In the 1790 census the population of Philadelphia proper was recorded as 28,522 (14), although some have estimated the total population in 1793, including suburbs and nearby rural areas, as between 38,000 and 55,000 (13, 15). There were several hundred medical practitioners in Philadelphia, including apothecaries, barbers, surgeons, preachers, housewives, and quacks, but only 80 had a medical degree (16).

Philadelphia was no stranger to epidemics. Almost every year a disorder would achieve epidemic proportions. The first recorded epidemic of yellow fever in the city was in 1699, and it had recurred periodically until the last previous major epidemic of the disease in 1762.

The winter and spring of 1793 had been mild and wet, but June saw the onset of hot, dry weather that eventually became a drought. Several contemporary writers noted that there was a very large and pesky population of mosquitoes (15). Since late in 1792, Philadelphia had experienced epidemics of mumps, scarlatina, "cholera morbus" (gastroenteritis), and influenza. The hot, dry weather was dreaded as a harbinger of other fevers to come.

Beginning in July 1793, Philadelphia experienced a major influx of refugees from the West Indies, where the combined effects of a slave revolt and epidemic disease led to the panicked flight of European settlers, mainly French. Some 2000 of these refugees, sickly and destitute, descended upon Philadelphia. In retrospect, this was surely the source of the Philadelphia yellow fever epidemic, although there was heated argument at the time as to whether the cause was "dirty streets or dirty foreigners." There was also bitter disagreement as to whether the disease could be transmitted by "contagion," or direct contact with an infected person or fomites, or only through an unhealthy "miasma" in the environment.

In late July, the first cases of yellow fever appeared along the waterfront in Philadelphia. The persons affected were transients, immigrants, and the poor, and they did not at first attract the eye of the medical establishment. However, in August, Rush saw several cases in his own practice and, through discussion with colleagues, identified more. On August 19, Rush became convinced that the city was in the early stages of an epidemic of the "bilious remitting yellow fever," and he made a public announcement to that effect. He was immediately ridiculed and attacked from all sides as an alarmist. He persisted in his diagnosis, however, and he warned the mayor of Philadelphia, Matthew Clarkson, and the governor of Pennsylvania, Thomas Mifflin, of

his concerns. At Rush's urging, the mayor asked the College of Physicians to convene and make recommendations concerning the problem. In the meantime, the mayor made some public announcements and urged a general cleanup of the city.

The College of Physicians met on Sunday, August 25. Only 16 of the 26 members came to the meeting. They appointed a committee, which included Rush (and some of his most implacable enemies), to draft an official report for the College. Rush immediately drafted a report. When the College reconvened on August 26, only 11 members appeared, but Rush's report was adopted unanimously. The report recommended a broad scope of action to deal with the crisis, ranging from a recommendation that the almost continuous tolling of funeral bells be stopped to measures of personal and public health. The report equivocated on the issue of contagion by contact with the sick, but it also endorsed the environmental, or miasmatic, theory of causation (17).

By August 25, panic gripped what had been a complacent city. A mass exodus of those with the means to flee began. Estimates of the number of persons abandoning Philadelphia and its suburbs for presumably safer locations range from 17,000 to as much as half the total population. The commercial, public, and intellectual life of the city came to a virtual standstill, and only 1 newspaper continued publication.

Surrounding communities set up committees to intercept and divert refugees, closed bridges and roads, and otherwise acted in a panic that equaled that of Philadelphia itself, where parents abandoned children, and children threw parents into the streets at the first sign of illness.

During the 100-day epidemic, there were at least 4044 deaths in Philadelphia (based upon grave counts), although the total was probably considerably more. At the height of the epidemic, mass burials with as many as 10 to 15 bodies to a grave were common. It is impossible to accurately estimate case fatality rates. Thomas Jefferson (who left town) estimated that 33% of infected individuals died. Modern data on yellow fever epidemics yield case fatality rates ranging from 10% to 60%. In 1966, Chris Holmes made an effort to identify by name as many of Rush's patients as possible and to track outcomes of his management. He estimated that 46% of Rush's patients died (8).

Some of Philadelphia's doctors fled, including some of the most prominent. Of those who stayed, 10 died in the epidemic. At one point, Rush wrote, only 3 physicians were available to treat thousands of the sick.

## DEPLETION THERAPY

Rush was a devoted and admiring student of William Cullen (1710–1790), his mentor at the University of Edinburgh. Among Cullen's contributions were his efforts in nosology. He classified diseases on the basis of symptoms and a theory of nervous action. The classification was clinically useless as a guide to etiology, diagnosis, or treatment. Rush loyally attempted to follow this doctrine but became increasingly frustrated. Eventually he came to reject not only Cullen's work but all attempts at nosology. In 1789, he announced that he had discovered a new principle of medicine, that there was only 1 fever in the world. He held that all fevers were a single entity, just as fire is a single entity: "Thus fire is a unit whether it be produced by friction, percussion, electricity, fermentation, or by a piece of wood or coal in a state of

inflammation." The proximate cause of fever was an "irregular convulsive action of the blood vessels." Local manifestations such as pleurisy, tonsillitis, or rashes were details of little importance. Treatment was correspondingly simplified and directed at calming the excited vessels, which frequently required purging and bleeding, or depletion therapy (18).

By 1796, Rush had amplified his unitary principle of fever into a unitary principle of disease.

I have formerly said there is but one fever in the world. Be not startled, Gentlemen, follow me and I will say there is but one disease in the world. The proximate cause of disease is irregular convulsive . . . action in the [vascular] system affected (19).

Furthermore, he stated that

the multiplication of diseases . . . [is] as repugnant to truth in medicine, as polytheism is to truth in religion. The physician who considers every different affection of the different systems of the body . . . as distinct diseases when they arise from one cause, resembles the Indian or African savage, who considers water, dew, ice, frost and snow as distinct essences (19).

Yellow fever is a viral disease borne by mosquitoes of the genus *Aedes*. The incubation period is 3 to 6 days, followed by abrupt onset of fever, chills, and generalized aches and pains. The clinical course is quite varied, ranging from a mild flulike illness of a few days' duration to death, usually within 2 to 6 days. It is a biphasic illness, the fever subsiding, or remitting, in 2 or 3 days, only to recur in another 2 or 3 days and then persisting throughout the remainder of the 7- to 10-day course of the disease. In severe and perhaps typical cases, hemorrhagic phenomena are prominent, especially nosebleeds, ecchymoses, and gingival and gastrointestinal bleeding. (Another common name for the yellow fever in Rush's time was the "black vomit.") Jaundice is usually present during the second phase of the disease. Myocarditis with shock is a particularly lethal complication, but other organ failure syndromes contribute to the mortality, which varies greatly from one epidemic to another.

When Rush first recognized yellow fever in Philadelphia, conventional treatment consisted largely of supportive therapy with bland diet, cool fluids, rest, and perhaps mild stimulants or a dose of Peruvian bark. Often, a grain of calomel, with or without a grain of the vegetable laxative jalap, was prescribed. Four of the first 5 patients Rush saw treated in this way died. Rush was horrified. He engaged in an extensive review of the available literature on yellow fever. He discovered a manuscript written in 1744 by Dr. John Mitchell of Urbana, Virginia, detailing his experiences with yellow fever from 1737 to 1742. Dr. Mitchell's account included autopsy reports. Mitchell was greatly impressed by the gastrointestinal hemorrhage present in the fatal cases, which he attributed to vascular spasms. He recommended purging and bloodletting as an effective treatment. Rush immediately adopted these therapeutic suggestions with some moderation, but by mid-September he experienced an almost religious epiphany that more extreme treatment would be curative (8, 20, 21):

I preferred frequent and small, to large bleedings in the beginning of September, but toward the height and close of the epidemic, I saw no inconvenience from the loss of a pint and even 20 ounces of blood at a time. I drew from many persons 70 and 80 ounces in five days, and from a few a much larger quantity (21).

Never before did I experience such a sublime joy as I now felt in contemplating the success of my remedies. It repaid me for all the toils and studies of my life (20).

Rush claimed never to have lost a patient he bled as many as 7 times. Given the natural history of yellow fever as a 7- to 10-day disease, this may not surprise us. Given further the knowledge that at least some of Rush's patients probably did not have yellow fever, it is even less surprising, although the notion of legions of anemic Philadelphians stumbling about in the midst of chaos is not an attractive one.

Rush entered a frenzied state, personally seeing as many as 100 patients a day. His home became a clinic and a sort of pharmaceutical factory staffed by 5 of his students and apprentices, 3 of whom died of yellow fever. So much blood was spilled in the front yard that the site became malodorous and buzzed with flies. He prescribed repeated doses of pills and powders consisting of 10 grains of calomel and 10 grains (later 15) of jalap, at least 10 times the customary dose. These produced copious black stools and often provoked gastrointestinal bleeding before finally yielding only a few shreds of mucus. Rush estimated that the average person contained 25 pounds of blood and recommended that up to 80% be removed. He proclaimed the success of his cure to the public and his medical colleagues; wrote newspaper articles, advertisements, and brochures; and harangued people in the streets. At least a half dozen Philadelphia physicians supported Rush and adopted his treatment recommendations, though some of them later recanted. The majority of the medical community, especially the members of the College of Physicians, rejected Rush and his cures, using terms and phrases like "murderous" or "doses fit for a horse." Competing suggestions for treatment and prevention of the disease were published by many individuals, thoroughly confusing the citizens of the city. When Alexander Hamilton and his wife became ill in early September, they sent for Dr. Stevens, an advocate of mild supportive care. When they survived, Hamilton published accolades and recommended Stevens to all comers, as a preferred alternative to Rush (22). (Hamilton, a Federalist, and Rush hated each other because of political differences. Hamilton later blocked Rush's appointment to the faculty of Columbia Medical School in New York.)

On the 14th of September, Rush became ill with a fever. He took 2 doses of calomel and was bled a total of 20 ounces (23). This restored him to health, and he resumed his frantic pace. Fierce and open opposition to Rush continued, especially among the physicians. He was forced to resign from the College of Physicians, and for a time there was talk of bringing criminal charges against him. All this inspired a typical response from Rush:

The success which attended the remedies which it pleased God to make me the instrument of introducing . . . in 1793 produced . . . the most violent and undisguised exertions to . . . discredit these remedies. . . . The public effusions of gratitude which issued from many persons who ascribed the preservation of their lives to my remedies produced . . . the most inveterate malice. . . . No, citizens of Philadelphia, it was for your sakes only I opposed their errors and prejudices, and to this opposition many thousand people owed their lives (8).

Rush continued to advocate his depletion therapy during the yellow fever epidemics in Philadelphia in 1794 and 1797, although his reputation and practice were already waning. By 1797,

William Cobbett, the satiric journalist who frequently targeted Rush, was in full cry. He reviewed the 1793 bills of mortality for Philadelphia and showed that the mortality rates increased significantly following the institution of Rush's remedies. He characterized Rush's work as ". . . one of those great discoveries which have contributed to the depopulation of the earth." When Rush referred to calomel as the "Samson of medicine," Cobbett wrote:

Dr. Rush in that emphatical style which is peculiar to himself calls mercury the Samson of medicine. In his hands and those of his partisans it may indeed be justly compared to Samson: for I verily believe they have slain more Americans with it than ever Samson slew of the Philistines. The Israelite slew his thousands, but the Rushites have slain their tens of thousands (24).

Rush sued Cobbett for libel in 1797. The case dragged on for 2 years, probably due to political maneuvering by Rush's enemies. Cobbett was found guilty and fined \$5000 (later reduced to \$4250), at the time the largest award ever made in Pennsylvania. The damage had long since been done, however, and Rush's practice had vanished by 1797.

## CONCLUSION

Benjamin Rush has been hailed as "the American Sydenham," "the Pennsylvania Hippocrates," the "father of modern psychiatry," and the founder of American medicine. The American Medical Association erected a statue of him in Washington, DC, the only physician so honored. A medical school is named after him. He was a prolific and facile writer and a very influential teacher. Yet, the only enduring mark he has left on the history of American medicine is his embarrassing, obdurate, messianic insistence, in the face of all factual evidence to the contrary, on the curative powers of heroic depletion therapy. Rush's thinking was rooted in an unscientific revelation as to the unitary nature of disease, which he never questioned. He viewed nature as a treacherous adversary to be fought on the battleground of his patients' bodies. It is hard to imagine philosophies more radically at variance with those of Hippocrates and Sydenham.

Rush prided himself on his powers of observation. He carried a notebook with him everywhere and, in his highly disciplined way, recorded conversations, observations, thoughts, about everything under the sun. He appeared to have abandoned this habit during the epidemic, perhaps because of his frenzied practice. There can be no question that Rush's mercury purges and copious bloodletting were profoundly erroneous and sometimes fatal. How many hundreds of deaths Rush watched during the epidemic is not known, but in each case he found some way to exonerate his "remedies" as a cause. Many people that Rush should have respected, including most of his professional colleagues, pointed to their own observations that Rush's treatment was often worse than the disease and murderous in its consequences. As the controversy became more public and strident, Rush's defense of his treatment, always vitriolic, took on increasingly paranoid overtones. He truly believed that he had been chosen by God to save the people of Philadelphia and that opposition to his views was heretical and sacrilegious.

How could this brilliant and highly educated man have gone so wrong? Rush was horrified by the onslaught of yellow fever in Philadelphia and by the response of the citizens. He was driven by a great desire to do good. The latter was strongly conditioned

by his religious beliefs, although Rush's theology was no better than his medical theorizing. Instead, he was possessed by a consuming and implacable evangelical passion that left no room for doubt or reason. When Rush's impulse to do good was yoked to the belief that God had chosen him above all others to devise or discover a cure for yellow fever, the stage was set for depletion therapy. Mitchell's purge and bleed manuscript provided the final element in this epic.

Rush's mother had wanted him to become a clergyman. He seriously considered this before deciding to pursue a career in medicine. The history of American medicine would surely be quite different had Rush limited himself to preaching and left the purging and bleeding to others.

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*A bibliographic preface:*

Medical historians should, to the extent possible, make use of well-documented primary sources. However, in this essay, the author has been forced by geographic and financial constraints to rely heavily on secondary sources published by reputable scholars. If there are errors in this paper, they are the responsibility of the author, who has not found it possible to directly verify some quotes.

Any student of the yellow fever epidemic in Philadelphia in 1793 must carefully read John Harvey Powell's masterpiece *Bring Out Your Dead*. Originally published in 1949 and republished in 1993 on the bicentennial of the epidemic, this book is a hybrid, with elements reminiscent of a historical novel, as well as a richly detailed scholarly work. Powell taught at the University of Delaware and was later director of research at the Free Library of Philadelphia, a prime source of information about both the city and Rush.

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