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Benjamin Rush.
Courtesy of the National Library of Medicine.
Plagiarism of ideas

Benjamin Rush and Charles Caldwell—a student-mentor dispute

Charles T. Ambrose, MD
Plagiarism has likely been a vexing concern in all literate cultures. Even before writing first appeared, bards of old probably complained of rival fabulists having filched their best tales. Today plagiarism is of two types—stealing written words or pirating a novel idea/concept. Text plagiarism involves assuming authorship of a passage written by someone else; we are not concerned with it here. Concept plagiarism concerns claiming the origin of an idea/concept conceived and generally published earlier by someone else. While similar or even identical ideas may occur independently to several investigators, appropriating another’s novel concept without due attribution is a serious offense in the sciences, since this may later raise the thorny issue of priority of discovery. Much of research today is highly competitive; the primacy of discovery often determines not only favorable recognition but also income, advancement, and tenure in academia and industry. Research universities occasionally have had to confront troubling instances of concept plagiarism involving students and mentors.

A notable example occurred at Rutgers University in 1943. Professor Selman A. Waksman claimed priority for the discovery of streptomycin, which had been originally isolated and studied independently by his graduate student, Albert Schatz. Even though Schatz was senior author on the first two papers describing the new antibiotic, Waksman deprecated Schatz’s contribution to its discovery and development into a potent drug, and became the sole recipient of the Nobel Prize in 1952. Schatz had received a legal settlement from Waksman and Rutgers in 1950.²

A much earlier and little known case of purported plagiarism involved Dr. Benjamin Rush, the foremost physician of colonial America, and a young student, Charles Caldwell. During the defense of his medical dissertation in 1796, Caldwell clashed with Rush over who stole certain of its ideas from whom. While Rush is quite well known, Caldwell is far less so, although during the early nineteenth century he became a significant medical educator in Kentucky.

Pennsylvania Hospital. Courtesy of the National Library of Medicine.
Benjamin Rush (1745–1813)

Benjamin Rush is remembered today as a minor patriot during the American Revolution who later became the most influential physician of his time. He represented the interests of Pennsylvania in the Continental Congress between 1774 and 1789, and was one of five physicians to sign the Declaration of Independence (just above Benjamin Franklin). Rush influenced Thomas Paine’s political ideas and even provided the title for his famous work, Common Sense (1776). During the war, from 1777 through 1778, he served as a military physician inspecting army hospitals.

Rush’s medical fame arose mainly during the last two decades of his life, beginning with Philadelphia’s 1793 yellow fever epidemic, which killed ten percent of the city’s forty to fifty thousand residents. Only during the course of this outbreak did he come to believe that yellow fever was not contagious. He later wrote, “For the change of my opinion upon this subject, I am indebted to Dr. Caldwell’s and Mr. [Noah] Webster’s publications upon pestilential diseases.”

During the epidemic, Rush was noted for his harsh treatment of patients, bleeding them copiously and purging them frequently with large doses of calomel (HgCl) and jalap (a strong cathartic made from the root of a Mexican plant). Though he sought to convert other physicians to his approach, many strenuously rejected it. Thomas Jefferson wrote to a friend that Rush “in his theory of bleeding and mercury... has done much harm, in the sincerest persuasion that he was preserving life and happiness to all around him.”

Indian physician who employed “stimulants—bark [quinine], wine, spirits” instead of Rush’s “heroic” approach.

During the second yellow fever epidemic of 1797, Rush’s medical reputation came under fire from a radical journalist and English political refugee, William Cobbett. In spite of his “disdain for the Colonials,” Cobbett had settled in Philadelphia and soon came to hate Rush “because of his republicanism.” He published scathing articles in his royalist newspaper, Porcupine’s Gazette, under the pen name Peter Porcupine. When others merely questioned Rush’s copious bloodletting and vigorous purging, Cobbett published invective-filled articles disparaging this treatment and denouncing Rush for promoting it in his frequent letters to newspapers. Cobbett’s ridicule was successful in reducing the number of new patients seeking Rush’s medical care and prompted him to consider moving his practice to New York City. But his overtures for an appointment to the medical faculty of King’s College (now Columbia University) were rebuffed by the influence of Alexander Hamilton (a Federalist), who considered Rush (a Democrat like Jefferson) too radical. With his medical income greatly reduced, Rush prevailed on President John Adams to appoint him treasurer of the mint. In 1800 Rush sued Cobbett for slander and won a settlement of $5000 at the libel trial in a New York court. Rush also regained his remunerative medical practice in Philadelphia.

During Rush’s lifetime, medical practice was roiled by differing belief systems about the causes of diseases. Spirited debates over medical theory threatened the fraternity of physicians, while confused patients questioned the various treatments offered by rival doctors. Infectious diseases were given
Linnaean-type names based on particular signs or symptoms, resulting in medical dictionaries with a bewildering nosology. The humoral notions of Hippocrates and Galen were rejected by some British doctors who instead speculated that diseases were due to the toxicity of various parts of the body. The Scottish physicians William Cullen and John Brown attributed illnesses to tensions in the brain and nerves (stenic and asthenic forces). In contrast, Parisian François Broussais taught that the basis of all pathology was gastroenteritis.

Meanwhile, in Philadelphia Benjamin Rush focused on the flushed skin of febrile patients with infections or those who developed them secondarily during their illnesses. He interpreted this physical sign as due to “excess excitability in the blood vessels,” and developed a theory of the unity of diseases based on the commonality of fever present in most patients. According to Rush, mankind suffered from one significant disease, arterial wall hyperexcitability, which could be relieved by bleeding, purges, and salivation induced by calomel.

Rush’s aggressive approach with lancet and mercury reflected his rejection of a major Hippocratic belief—the healing power of nature (vis medicatrix naturae). He “had no confidence in Mother Nature, and insisted that she be driven from the sick room as one would a stray dog or cat.” In his defense, however, he is credited with two valuable medical ideas: the notion of focal infections and the enlightened care of the insane. Rush suggested, for example, that decayed teeth might be the source of much general pathology. He wrote the first American book on mental diseases—Medical Inquiries and Observations upon the Disease of the Mind (1812)—and is now regarded as the father of American psychiatry. But many were skeptical of his medical system and writings. Elisha Bartlett regarded as the father of American psychiatry. But many were skeptical of his medical system and writings. Elisha Bartlett declared that “There is more utter nonsense and unqualified skepticism of his medical system and writings. Elisha Bartlett declared that “There is more utter nonsense and unqualified absurdisty in Rush’s works than in the whole vast compass of medical literature.”

Charles Caldwell (1772–1853)

In 1792, at the age of twenty, Charles Caldwell traveled from North Carolina to Philadelphia to begin medical studies at the University of Pennsylvania. There he immediately came under the influence of Dr. Benjamin Rush, Professor of the Institutes of Medicine and Clinical Practice. When the horrendous yellow fever epidemic engulfed Philadelphia in the fall of 1793, a pest house was established in an empty mansion on the outskirts of the city. At Rush’s recommendation Caldwell lived and worked as an unpaid medical attendant there. His close contact with patients during the plague led him to be among the first to become convinced and to declare that yellow fever was not spread from person to person—a view Rush later adopted.

At Rush’s suggestion, Caldwell spent much of 1794 translating Johann Friedrich Blumenbach’s Institutiones physiologicae (1786) into English. The “genuine, knotty, German Latin” was difficult and so taxing that by the fall Caldwell was “mentally fatigued and . . . debilitated” and felt the need of “muscular action and country air.” He achieved it through a short-term enlistment as surgeon in a federal military expedition sent to stamp out the Whiskey Rebellion in western Pennsylvania.

The Whiskey Rebellion arose in response for a 1791 tax on distilleries to help pay state war claims. Whiskey made from surplus corn was used instead of rarer metal or paper currency since kegs were more easily transported than whole corn. To many settlers in the Appalachians and beyond this tax was considered unjust and reminiscent of the infamous British Stamp Act. For several years federal agents had attempted to collect the new whiskey tax, but many were thwarted and even assaulted—several being tarred, feathered, and carried out of town on a rail. Some irate farmers of the Monongahela Valley vowed never to pay the tax and threatened to secede from the Union, hence the name of the conflict. On August 7, 1794, President Washington called up the four-state militia of 12,000 men, a force larger than any one group he had commanded during the Revolutionary war. He left Philadelphia (then the country’s temporary capital) on October 1, and accompanied the army as far west as Bedford. The insurrection collapsed upon the approach of such an overwhelming federal force.

One morning in early October, just weeks before the peace, the newly commissioned Caldwell had set out on foot to the first encampment of his brigade at Downington, thirty-two miles west of Philadelphia. His personal baggage, camp equipment, and newly purchased medical and surgical supplies had preceded him by several hours in a light wagon he had hired. In an effort to catch up with it, he and a companion proceeded at a strenuous walking pace, leaving both of them fatigued on arrival that night. When Caldwell awoke the next morning he felt slightly feverish and was lent a horse to continue westward. Later during his ride “a copious shower of rain” drenched him thoroughly and to his surprise “entirely extinguished” the slight fever he labored under. In a day or so he reached the next encampment in Lancaster, where his brigade remained for a week. During this pause he penned a letter to Rush, describing the “perfect hydropathic cure” of the fever he had just experienced. Caldwell ignored the fact that his equally fatigued companion went by cart to Lancaster and was found there with “his soreness and fever . . . considerably abated,” presumably without the aid of any hydropathic therapy. He gave no further details of his military service, which ended within a few weeks after it had begun and allowed his return to Philadelphia.

Once back at school, Caldwell learned that Rush had discussed in his course of lectures “the curability of fever by a thorough wetting in rain, or by immersion in water,” This “cure” was also mentioned by Rush in the following year. His failure to acknowledge in either lecture that Caldwell had written to him about his experience led to a breach in their early friendship and the subsequent charge of plagiarism leveled by the disillusioned student against his mentor.
Plagiarism of ideas

Caldwell's case

During the late winter of 1794/1795 Caldwell read a paper before a Philadelphia medical group titled, "Use of Cold Water in the Treatment of Fever." Several members in the audience knew of Caldwell's letter on the subject to Rush and anticipated beforehand that Caldwell would voice his well-known disappointment in not having been given due credit by the Professor of Theory and Practice of Medicine. Rush was not in attendance. But, reluctant to accuse his mentor publicly of plagiarism, Caldwell expressed the belief that Rush would be able to establish that he had "observed, in his own practice, the cure of fever by a fall of rain . . . [or] that he had found cures of the kind recorded in some book . . . [and] had forgotten to make the reference when he mentioned the fact." Such an admission would relieve Rush of the stigma of "deriving knowledge from a pupil, and silently using it as his own."

One of Rush's students attending the lecture asked Caldwell whether he "thought himself justified in throwing . . . suspicion on the conduct and character of the distinguished Professor." Caldwell rose to his feet and stated that he always felt "justified in stating the truth," and concluded by suggesting that his interlocutor "deems it possible for Dr. Rush to be guilty of plagiarism; I deem it impossible." Caldwell implied that had Rush been present, he could have satisfactorily clarified the matter.

He later learned that Rush had sensed the damning insinuation and felt "that suspicion was irrevocably fixed on his own conduct." And so in a subsequent lecture Rush explained that he had omitted any reference to Caldwell's contribution because he had intended to acknowledge it "in a work he was then preparing for the press." (This work was never published.) And so the issue Caldwell implied in his talk simmered in the minds of some over the ensuing months.

All during this time Caldwell had taken copious notes on his professors' lectures and published occasional newspaper reviews of them under the pen name of "a Medical Student." Because some articles were critical of the medical ideas and reviews of them under the pen name of "a Medical Student." His two main examiners were Dr. Rush and Dr. Caspar Wistar, Professor of Anatomy. Caldwell had previously criticized Dr. Wistar's lecture on "the uses of the cellular membrane" in the development of general anasarca. But according to Caldwell's recollections a half century later, the professor had recognized the correctness of his student's view and treated him with "great courtesy and politeness" thereafter and, presumably, also during the thesis examination. However, the oral examination by Dr. Rush became the "explosion" Caldwell had expected.

Caldwell had initially inserted into his thesis "a brief account of [his army letter of 1794], respecting the cure of fever by a shower of rain, and the purpose to which Dr. Rush had applied it." But after the initial printing and at the suggestion of the Dean of the Faculty, Caldwell requested the printer to omit this insertion and deliver to Rush a revised, expunged version. Caldwell wrote that at the public defense Dr. Rush "referred to [the army letter] with great virulence and blame." Caldwell rose, addressed the presiding professor, and "said with great calmness, and in a suppressed tone, 'I was summoned here . . . to defend only what is contained in my thesis; not what I have stricken out of it.'" The provost ruled that "Dr. Rush has no right to refer to [the expunged passage]. In doing so, he is out of order."

Rush vehemently asserted that he had a right and called on Caldwell to defend his account. A heated exchange between the provost and the two disputants led Caldwell to take the pamphlet "unceremoniously" out of Rush's hand and to identify the passage at issue being present in it. But copies held by other members of the examining board were devoid of the passage. Caldwell exclaimed "in a tone of cutting sarcasm: 'This is a spurious copy of my thesis, procured by what device I know not, and brought here for what purpose I care not.'" After some further histrionics, Caldwell added, "The printer of my thesis

* The practice of cooling the febrile body with cold water probably dates to Hippocrates' time, but it gained prominence near the end of the eighteenth century when James Currie of Liverpool prescribed this treatment for cases of typhus/typhoid fever. Currie believed that the heat of a fever was due to a "'morbid stricture' of the capillaries of the skin and internal organs," an idea similar to Rush's. In modern times in Boston cold water-drenched sheets were among the measures used to treat patients with fevers above 105°F.
informed you yesterday that the passage [in question] was erased by my order." Rush declared that the printer “did not tell me that the passage was stricken out; but only that it was to be stricken out. But finding it here . . . , I felt authorized to suppose the order to be withdrawn.” Caldwell concluded the incendiary interchange by declaring, “Had you looked into the copy which, by my direction, [the printer] sent to you this morning . . . you would have perceived that my order to him had been faithfully executed.”

Caldwell wrote that Dr. Rush, “almost hysterical with rage,” said to him, “Sir, do you know . . . who I am . . . when you presume thus arrogantly to address me?” The provost requested calmness and decorum so that the “business of the day should go on.” Caldwell ultimately passed his dissertation defense, but Rush refused to sign his name to the diploma alongside those of the other professors unless Caldwell would retract some “expressions, and apologize for having used them.” Only several years later did mutual friends of the two arranged a polite truce at which time Rush finally signed the diploma.

Rush’s afterthoughts

In May 1796 Rush forwarded to John Redman Coxe, Professor of Chemistry at the University in Philadelphia, several student theses, including that of Caldwell. Rush wrote, “Dr. Caldwell’s [thesis] you will perceive is stolen from my publications and lectures. I convicted him of plagiarism at the public examination of his thesis.” In Caldwell’s later recollection of his dissertation defense he focused exclusively on his rain cure for fever and mentioned nothing about the unity of the three diseases discussed in his thesis. Rush, on the other hand, did not allude to the rain cure of fever but only to what Caldwell had contested in Rush’s “publications and lectures”—that is, the idea of the unity of disease.

In December 1809 Rush wrote, “Dr. Caldwell’s opposition and hostility to me have met with a severe check.” Rush reported that Caldwell had complained that “students would attend his lectures, were they not afraid of old Rush blackballing them when they were examined for degrees.” But according to Rush, the class expressed their indignation against Caldwell and passed a vote in favor of Rush. Caldwell “was publicly hissed in Dr. Coxe’s lecturing room” and later “was refused admittance into the lecturing room by the janitor of the University.” In February 1810 Rush remarked about Caldwell, “His name is never mentioned by the students but with contempt and detestation.”

And in April 1810 Rush wrote that “Dr. Caldwell finished his lectures with a most intemperate phillipic against my system of medicine. . . . I have refused all intercourse with him.” Shortly before he died, Rush compiled a list of medical students who had received individual training under him. It began with students who registered in 1812 and continued in reverse order to those in 1770, the first year of Rush’s medical practice. Caldwell’s name is not included among the 135 students listed.

Caldwell’s later life

After the fracas at his thesis defense, Caldwell established a private practice in Philadelphia, joined various societies there, gave numerous invited public discourses, and charged students for freelance lectures on various medical subjects such as physiology and medical jurisprudence. Caldwell regarded himself as the cynosure of the academic life in Philadelphia. All the while he coveted Rush’s professorial chair and waited.

In 1815 the University of Pennsylvania established a Faculty of Physical Sciences, where Caldwell gave three courses of lectures in 1816 and 1819. According to his autobiography, he was appointed Professor of Geology and the Philosophy of Natural History. But R. A. Glock, in his 1959 master’s thesis, determined that Caldwell never received an official appointment. Rush died in 1813 but not before arranging that his chair in the Faculty of Medicine be occupied by someone other than Caldwell. Within two years the chair again fell vacant and the person appointed was someone of whom Caldwell naturally held a low opinion.

Recognizing that his academic prospects in Philadelphia were dim, Caldwell accepted an offer for a medical professorship at the fledgling Transylvania University in Lexington, Kentucky. This university, the first west of the Alleghenies, had been founded by the General Assembly of Virginia in 1780. The trustees established a Medical Department in 1799, making it then the fifth medical school in the country.

In the fall of 1819 Caldwell moved to Lexington and found thirty-seven students and a “most miserable” faculty waiting for him at Transylvania University. He termed three of the professors “little else than medical ciphers” and regarded the surgeon Benjamin Winslow Dudley as “the only one that was qualified and resolutely determined to work.” Yet during Caldwell’s first decade at Transylvania University, its medical department grew to rival that of Pennsylvania in the rising reputation of its faculty and its growing library of imported European medical books and scientific instruments.

Caldwell taught in Lexington for nearly two decades and in his autobiography claimed (incorrectly) to have established the Medical Department there. In point of fact, he was responsible for replacing its preceptorship-type training with formal courses, regular lectures, and examinations. He gave lectures on physiology, pathology, and hygiene, and occasionally therapeutics or medical jurisprudence. He opposed including chemistry in the medical curriculum and later became enamored of mesmerism, phrenology, and spiritualism.

In the late 1830s inland Lexington was becoming eclipsed economically by the growing river cities of Louisville and Cincinnati. Important political leaders and doctors in Louisville...
funded a new medical school there, to which Caldwell and several Transylvania professors moved in 1837. A chair at the Louisville Medical Institute was established specifically for him. He continued publishing articles on phrenology and medical jurisprudence but never contributed to the fertile field of gross pathology. According to Caldwell’s colleague, Louisville medical professor Lundsford P. Yandell, Sr., Caldwell “slept through” the advances being made in physiology. As he had in Philadelphia and Lexington, he so antagonized colleagues in Louisville by his superior attitude that in 1849 he was asked to step down, ostensibly because of his approaching the age of seventy. In retaliation, Caldwell sought to establish a rival medical school in Nashville but was unsuccessful. Instead, he spent his final years penning a caustic autobiography, reviewing “what [he had] done and suffered.” In it he omitted any mention of his two wives, the famous cholera epidemic in Lexington of 1832, and many medically relevant events of the period in which he lived. Typical of his focus of the autobiography was page 192, which contains the pronoun “I” twenty times.

Plagiarism of ideas today

Their conflict shows both Rush and Caldwell in an unfavorable light. Lost in their several petty disputes was the seminal observation about the non-contagion of yellow fever—first made by Caldwell and quickly adopted by Rush. Instead, they brooded on the presumed plagiarism of several ideas of little relevance in medicine today. Since Rush never published any of the ideas presumably purloined from Caldwell, he could be absolved of plagiarism in print—but not during his lectures.

Instances of concept plagiarism in the scientific literature seem to have exploded in recent years, reflecting perhaps the exponential rise in publications and the burgeoning number of stressed scientists competing for limited research support. The news pages of *Nature* and *Science* regularly report misappropriation of scientific ideas. In one example in 1999 at Columbia University, a graduate student accused members of her thesis committee of incorporating ideas from her dissertation without her consent when they applied for a departmental research grant. Another lawsuit at Columbia University in the same year involved competing claims by a student and his
professor-mentor over which had devised a new mathematical proof. As in the Rush/Caldwell case, what might seem of minor importance to an independent observer was regarded as serious intellectual theft by the aggrieved students at Columbia.

A similar threat to the integrity of scientific research are reviewers who misuse information they read in manuscripts submitted to journals or in research grant proposals. An example widely discussed in 1989 concerned a reviewer who published as original some observations presumably from his experiments that paralleled those he had read in a paper by an investigator in the same field. The similar data were recognized by the original investigator and led to an investigation by NIH, which later debarred the reviewer from applying for future federal grants.17

Stephen Jay Gould, the famous evolutionary biologist, secure in his tenure at Harvard University, could write that “Debates about the priority of ideas are usually the most misdirected in the history of science,”19p76 but the noted American sociologist of science Robert Merton emphasized “that competition and concern over priority and credit are not to be deprecated but are central to the scientific enterprise.”19p76 Concern over gaining the rewards of priority may lead to egregious actions. Jennifer Crocker, a social psychologist at Ohio State University, in her paper, “The road to fraud starts with a single step,” discusses the justifications offered by researchers who commit fraud, including the plagiarism of ideas.20

It is indisputable that plagiarism can occur unconsciously, since ideas remain in the memory long after they are first encountered.21 Scientists, no less than poets and writers of fiction, are sometimes beholden for inspiration to memories of conversations perhaps only vaguely recalled. This human propensity was inferred long ago when Johann Wolfgang von Goethe asked, “Who can say he has discovered this or that? It is frank foolishness to boast about priority and an unconscious conceit not to admit oneself a plagiarist.”22p239* Exploiting such an inspiration should not be decried—an idea residing in memory might not have come there fully formed but may profit from a new interpretation filtered through a new mind.

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References


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