Puerperal Fever

Of all acute diseases, the plague excepted, the puerperal fever is perhaps the most dangerous.

—Walter Channing, Miscellaneous Lecture Notes

It is almost impossible, when most American babies are born in clinical settings where antisepsis is routine and anesthesia is available, to contemplate the fear with which nineteenth-century women faced the suffering, disease, and death they associated with childbirth. The most uneventful delivery had its painful moments, and prolonged labors or instrumented births were certain to be extremely painful. Stalwart women might bear pain with little complaint, yet they faced the next pregnancy with vivid memories of their prior distress. Women with less self-control moaned and groaned as uterine contractions forced the baby through the birth canal and often screamed aloud as their bodies seemed to be torn apart. One of Channing’s patients, normally confident and well mannered, was so distraught that, in the midst of bodily agony and mental terror, she sat up in bed crying out, “I am scared!”

Their families shared their apprehension. “This is no light matter when it comes home to you in yr own family. There is so much anxiety & real danger that it is quite painful & I wish it were well over,” confessed Channing’s nephew William Henry Channing while awaiting the delivery of his sister’s first child. It was not uncommon for a woman to confess “unspeakable emotions of thankfulness to the Being who had preserved [her] through the hour of danger” or for her relatives to admit similar feelings of relief and gratitude. Having delivered a healthy baby, mothers still faced potential complications postpartum. None was more worrisome than the possibility of puerperal fever.
(also called childbed fever), which was frequently fatal. Though there are no reliable statistics to confirm the extent of nineteenth-century maternal mortality, the fact that so many people feared childbirth attests to the reality of their concerns.4

Two events occurred in Boston during the 1840s that presaged the better obstetrical care that eventually meliorated women's lives. Oliver Wendell Holmes's 1843 paper on puerperal fever provided a logical explanation for the transmission of the dread disease and unequivocal rules for its prevention. He did not identify the infecting agent, and there would be no effective cure for another hundred years, but his essay was an important beacon lighting the way toward safer childbirth. Three years later, the demonstration of surgical anesthesia at the Massachusetts General Hospital led in a short time to its use in obstetrics. Anesthetic relief of the pangs of childbirth altered the centuries-old assumption that pain was an inevitable part of parturition and eventually permitted more radical obstetric and gynecological procedures. The decade marked a high point in Boston medical circles and in the professional life of Walter Channing.

Channing had wrestled with puerperal fever from the earliest years of his practice.5 It was a disease that confounded and distressed him, as it did most physicians. A patient who had been safely delivered and was looking forward to motherhood might suddenly develop alarming symptoms that could be erratic in their development and sometimes subsided, but often led to a painful death. The symptoms might appear before or during delivery, within twenty-four hours after delivery, or a week later. Usually, but not always, the disease began with a severe chill followed by high fever, rapid pulse, headache, and acute pain in the pelvic area. The abdomen would swell and became exquisitely tender to the slightest touch. The pulse became more rapid and less distinguishable, respiration was difficult, and the patient became restless and disassociated from her surroundings. Sometimes a rash appeared. Nausea and vomiting, often of the most repugnant contents, frequently occurred. Death might take place within a few days or several weeks later. At autopsy, evidence of the disease might be confined to her uterus, be seen in her peritoneum, or found in other parts of her body.6 Death rates varied too, reaching as high as 80 to 90 percent in some European lying-in hospitals.7

By Channing's time, British physicians had written convincingly that puerperal fever was a specific disease, rather than one of the generic fevers and agues that described so many disorders. They also recognized that it appeared in the private practice of midwives and physicians as well as in maternity hospitals and that it could be sporadic as well as epidemic.

But there was little agreement on the nature of the disease. Was it auto-
genic, that is, due to something within the woman’s body, such as retained lochia (blood and mucus discharged from the vagina following delivery of a baby) or remnants of the placenta? Was it caused by environmental factors such as weather and climate? Was it the effect of poisons rising from bad air or putrid substances? Was it contagious in the traditional sense of disease transmitted from patient to patient, by either direct or indirect contact? 

Toward the end of the eighteenth century, Alexander Gordon, a Scottish physician, witnessed an outbreak of puerperal fever in Aberdeen and in 1795 he published a significant treatise on the subject. Gordon is credited with being the first writer to affirm the contagious nature of the disease as well as the means of its transmission. Previously, puerperal fever had been thought to attack women congregated in cities, whereas the epidemic in Aberdeen spread to women in nearby villages and on remote farms. By listing seventy-seven cases along with the name of the midwife or physician (including himself) who delivered the baby or the nurse present during the lying-in period, Gordon showed that specific attendants were carrying the disease from patient to patient. He claimed that he could “foretell what women would be affected with the disease, upon hearing by what midwife they were to be delivered, or by what nurse they were to be attended during their lying-in.” In almost every instance, Gordon’s prediction came true.

To prevent further spread of the disease, Gordon advised that “the patient’s apparel and bed-clothes ought, either to be burnt, or thoroughly purified; and the nurses and physicians, who have attended patients affected with the Puerperal Fever, ought carefully to wash themselves, and to get their apparel properly fumigated, before it be put on again.” He also suggested that there was a connection between cases of erysipelas (an acute infection of the skin and subcutaneous tissues) and puerperal fever, though he did not know what the common poison might be. These parts of his message were largely ignored, perhaps because of the enmity he aroused among the midwives and nurses whose names appeared in his treatise.

Gordon recommended drastic bleeding and purging, especially in early stages of the disease, as the most effective cure. The women and midwives of Aberdeen opposed these active remedies, believing that the epidemic was an ephemeral fever known as “the Weed,” for which bleeding and purging were deemed inappropriate treatment. However, the therapeutic portion of his treatise coincided well with contemporary medical theory and was accepted by many physicians. The medical writers who followed Gordon focused on variations of treatment, but they did not come any closer to understanding the nature of puerperal fever.

Channing had read all the authorities. Initially, he subscribed to the notion
that unfavorable conditions during pregnancy predisposed some women to the disease. Inadequate diet or lack of exercise might lead to costiveness (constipation) and thus to the retention of poisons. Too much exercise could cause pulmonary disease or hemorrhage and weaken a woman's constitution. Despondency and other psychological factors could also render her susceptible to disease.\textsuperscript{13} Channing knew from experience that puerperal fever often followed a prolonged or complicated labor, and he advocated taking measures to hasten delivery if danger threatened. He speculated, too, about phlegmasia dolens, wondering if the inflammation of the veins was somehow related to puerperal fever.\textsuperscript{14}

He was not convinced of the contagious nature of the disease, but was willing to accept as reasonable "removing the patient from the society and attendance of those, who have either visited or nursed patients ill of puerperal fever."\textsuperscript{15} Like everyone else, he was basing his ideas on cause and effect as observed in his own practice and described by other writers. Also like everyone else, he remained confused.

In his lectures Channing gave careful attention to the symptoms of puerperal fever. Because the initial abdominal pain was often mistaken for the harmless contractions that commonly follow delivery, it was important for young physicians to recognize the distinguishing features of puerperal fever and take immediate steps to combat it. Most experts agreed that there was a better chance of recovery if treatment was started on the first or second day of the disease. But there was disagreement as to the most effective mode of treatment, which ranged from extreme measures (bleeding, purging, emetics, application of moist heat, and enemas) to milder therapies (gentle laxatives and tonics).

Channing favored Alexander Gordon, who "assures us that the disease in his hands was more frequently cured, than in those of any other man's."\textsuperscript{16} Gordon's success depended on beginning treatment early with "great doses of jalap with calomel till diarrhæa come in" and copious bleeding from each arm, repeated if necessary.\textsuperscript{17} Channing's case notes confirm that he bled, purged, induced vomiting, and blistered in a desperate attempt to reverse the course of the disease. Once the patient had begun to sink and there was no reason to hope for recovery, the drastic measures were replaced by opiates and wine to support whatever strength remained and relieve the pain. But deep down, he had little hope for much success with any treatment.\textsuperscript{18}

His later lectures reflect the same uncertainty. He could not believe puerperal fever was contagious in the ordinary sense of the term (passed directly from patient to patient), primarily because it was not transmitted from puerperal women to males or non-pregnant women, whereas infectious diseases
such as smallpox knew no such distinctions. At the same time he suspected that it might be contagious in a different sense. Again, Gordon was instructive, as was John Haighton, whose lectures he had attended in London. Haighton taught that nurses (he did not refer to doctors) might communicate the disease from one person to another in their clothing. Since good ventilation and thorough cleansing were often effective in controlling epidemic puerperal fever in hospital settings, Channing could also support arguments that “some epidemic state of the air” might be at least part of the cause.19

Puerperal fever was a frequent topic at the meetings of the Boston Society for Medical Improvement. This professional association, like medical societies in numerous localities, combined professional concerns and continuing medical education with collegiality and sociability. Organized in 1828, it met biweekly at the homes of its members to exchange information on recent cases, discuss topics of common interest, and listen to prepared papers on contemporary medical questions.20 The anniversary dinner, regularly held each February, was an occasion for much good food and drink, accompanied by extravagant merriment. After one annual dinner, Oliver Wendell Holmes, in his capacity as secretary, noted that the company parted at an early hour of the morning “with mutual good wishes, and the proud consciousness that each was able to reach his own domicile unassisted, and unconvoyed.”21 Another year, Channing entertained his colleagues with “a sketch of an auscultator run mad as the pure pathologico-numerico-expectorante observer.”22

Channing had been one of the earliest invited to join this select group.23 Curiously, he was assigned to the committee on Medical Chemistry, Pharmacy, and Materia Medica rather than the committee on Midwifery. He was also a member of the standing committee charged with arrangements for the cabinet, or museum, of the society, where “well labeled” anatomical and pathological specimens were to be displayed.24 Obstetrical cases were frequently discussed at the meetings since all the members faced similar problems and dilemmas in their day-to-day practice.

The assigned topic for March 29, 1830 (a meeting held at Channing’s house), was “Varieties and treatment of puerperal fever.” The subject was particularly pertinent because several cases had recently occurred in Boston and its environs. One physician had lost five puerperal patients “in pretty quick succession,” yet during the same period of time he had attended other women who did not become ill. Perhaps there were different varieties of puerperal fever, some contagious and some not. The members were not able to reach a conclusion. They did agree, however, that the inflammation seemed to be “of an erysipelas nature” and that there probably was a correlation in a case where
a husband was "violently seized" with erysipelas and his wife developed puerperal fever.25

In the years that followed, Channing and his colleagues brought additional cases of puerperal fever to the attention of the society. In these reports too, the treatment and outcome of each case were carefully described. It was clear that everyone was baffled by the question of contagion. They recognized that the disease occurred in clusters and that there might be a surge in incidence followed by a temporary disappearance, but they remained unable to explain these phenomena.

On June 27, 1842, Channing read his notes on thirteen fatal cases of puerperal fever he had recently seen in Boston and vicinity.26 In the discussion that followed, mention was made of an outbreak of erysipelas and two cases of puerperal fever in a nearby town. Someone mentioned that the disease was then prevalent in New York. In early October Channing reported a woman with severe puerperal fever whom he had been asked to see that afternoon. Having recently read about a case of puerperal fever occurring in a house where typhus fever was also present, he suggested that this woman's illness might be related to typhus fever, which had been in her house for four weeks.27

At the same meeting, Dr. John Fisher detailed an alarming sequence of events: the autopsy of a woman who had died of puerperal fever; severe inflammation in the arm, high fever, nausea, chest pains, and general prostration of the physician who had performed the dissection; the subsequent death of a student who had assisted in the dissection and had attended the infected physician in his illness; and the sickness of a second student who attended the dissection. Interest in the subject quickened.28 At the end of November, Channing described another case to which he had recently been called. Puerperal fever had appeared thirty-six hours postpartum and the woman was dead two days later.29

Oliver Wendell Holmes, one of the younger members of the society, was much affected by the increasing reports of disease and death among newly delivered mothers and intrigued by the unresolved questions regarding transmission of the disease. He began to examine authoritative treatises, medical texts, and journal articles, seeking the common threads that might tie the cases together.30

At both January meetings, puerperal fever dominated the discussion. Channing reported additional cases, and John B. S. Jackson announced that a Dr. Barker of Lynn had died "from a dissection wound" incurred during the autopsy of a puerperal fever patient. The progress of his illness was similar to puerperal fever: rigor followed by intense heat, ardent thirst, pain and swelling of the shoulder, and gradual sinking.31 Jackson had been Dr. Barker's physi-
Cian. Troubled by the outcome, he asked the opinion of the society “as to the contagion of Puerperal Fever, and the probability of physicians communicating it from one patient to another.” So animated was the conversation that the members agreed to continue it at the following meeting. The stage was thus set for Holmes to deliver his paper “The Contagiousness of Puerperal Fever,” which became, in time, one of the classics of American medical literature.

Holmes presented a well-reasoned and carefully constructed argument to support the theory that puerperal fever was a contagious disease, transmitted from patient to patient by the attendant, be it physician, midwife, or nurse. His paper was based on published reports of puerperal fever epidemics, but no previous investigator had made such a broad survey of the literature. He quoted extensively from Alexander Gordon, who had presented a similar thesis based on his experience, and excerpted treatises of Charles White and John Armstrong that also showed a correlation between the incidence of disease and particular physicians’ practices. Numerous authors and articles from the London Medical Gazette, the Lancet, and other British medical journals were cited. The evidence was overwhelming: repeated incidence of puerperal fever in a single physician’s practice and horrendous epidemics in lying-in hospitals, where row after row of parturient women were examined and delivered by the same attendants. Holmes discounted the negative argument that because puerperal fever did not appear in every case a suspicious physician attended or in every hospital patient, it could not be contagious. “It signifies nothing that wise and experienced practitioners have sometimes doubted the reality of the danger in question; no man has the right to doubt it any longer.”

Holmes had also accumulated evidence from American medical journals and from correspondence with physicians in the Boston area who sent him thorough descriptions of puerperal fever cases in their practices. He had asked them for details: had they changed clothing between sick calls, had they attended erysipelas cases at the same time, were there any extenuating circumstances such as geographic or climatological influences that might bear on the incidence of puerperal fever? Their responses corroborated its contagious nature. He also recounted example after example in which postmortem exami-
nations of puerperal fever patients were followed by the appearance of the
disease in subsequent parturient women.

Holmes was outraged by the imputed misconduct of his colleagues and
had no tolerance for anyone who might disagree with him. He was particularly
critical of medical teachers who neglected to inform their students and col­
leagues about the terrible dangers inherent in puerperal fever or, even worse,
completely ignored the subject. In that context, he praised his own professor
of midwifery. “It gives me pleasure,” he wrote, “to remember that, while the
doctrine has been unceremoniously discredited in one of the leading journals,
and made very light of by teachers in two of the principal medical schools of
this country, Dr. Channing has for many years inculcated, and enforced by
examples, the danger to be apprehended and the precautions to be taken in
the disease under consideration.” Holmes had nicely exonerated him from
not giving sufficient attention to puerperal fever in his lectures and practice.
Yet Channing was still not convinced on the subject of contagion.

Holmes concluded his paper with a passionate plea for strict adherence to
practices that would prevent a “private pestilence,” as he called the transmis­sion of puerperal fever by physicians. He demanded that physicians who ex­pected to attend midwifery cases not take an active part in autopsies of
puerperal fever or erysipelas victims and that they take thorough precautions
even if only present at such autopsies. If a physician encountered puerperal
fever in his practice, he must “consider the next female he attends in labor,
unless some weeks, at least, have elapsed, as in danger of being infected by
him, and it is his duty to take every precaution to diminish her risk of disease
and death.” This might mean that the physician would have to give up his
midwifery practice for a month, even longer, yet Holmes did not equivocate.
“The time has come when the existence of a private pestilence in the sphere of
a single physician should be looked upon not as a misfortune but a crime; and
in the knowledge of such occurrences, the duties of the practitioner to his
profession, should give way to his paramount obligations to society.”

The eloquence of Holmes’s prose far outstripped its science. Although he
had accumulated abundant data to convincingly demonstrate the correlation
of puerperal fever cases and attendant, and the probable connection with ery­sipelas and wound fever, he could not explain what was carried from patient
to patient, or from cadaver to dissector to patient. Indeed, a few years later
when Ignaz Semmelweis, the physician in charge of the maternity wards at
the Vienna General Hospital, proved the contagiousness of puerperal fever
empirically by requiring that the medical students wash their hands with chlo­ride of lime before examining parturient patients and thereby reduced mater­
nal fatalities within a month from 18 percent to 2.45 percent, he first
attributed the disease to "cadaveric poisons." Semmelweis subsequently referred to "decomposing animal organic matter," but he was no closer to the correct explanation.36

Not until the advent of bacteriology in the 1860s and 1870s could the etiology of puerperal fever be clearly understood. It was Pasteur who, in 1879, identified the streptococcus as the cause of puerperal fever as well as erysipelas and the deadly septic disease that so frequently followed a dissection wound. It took many more years until the streptococcus was better understood and the particular strain most frequently associated with puerperal fever was identified. The work of Joseph Lister and the acceptance of antisepsis and aseptic procedures confirmed Holmes's and Semmelweis's demands for cleanliness in the birthing room, including cleanliness on the part of the physician, and made it easier to prevent puerperal fever. Nonetheless, until the sulfa drugs were discovered in the 1930s and penicillin became available in the 1940s, there were no reliable cures should the disease occur.37

Thus, although Holmes was thoroughly convinced that physicians were the agents of transmission, and the subsequent acceptance of germ theory makes his case self-evident, it remained difficult for many in the profession to accept his argument. It was, after all, a terrible indictment of their conduct. The minutes of the Society for Medical Improvement do not record the comments that followed Holmes's presentation. There is only the terse statement, "it was voted that Dr. Holmes be requested to publish the paper which he had just read."38 The litany of puerperal fever deaths grew that very same night, with Dr. Storer announcing recent cases that had occurred in the practices of Dr. Thaxter of Dorchester and Dr. Flint of Boston.

Channing was not present when Holmes read his landmark paper. It was not uncommon for him to miss a meeting. The vagaries of midwifery practice often constrained his other activities. He also had personal problems to distract him. His brother Henry and his youngest daughter, Lucy, were both invalids at his house and may well have prevented his attendance at a meeting so clearly interesting to him.39 No doubt he soon heard about the paper, for its conclusions were certain to provoke lively debate in the medical community. He did attend the next meeting of the society, on February 27, where he reported an outbreak of puerperal fever in Charlestown.40

Ten fatal cases had appeared in the practice of a single physician, four more cases in the practice of another. Channing had been asked to visit a woman in the neighborhood who became ill shortly after her labor began and was afraid that she too would die. He happily reported that she did not. During the discussion, Channing remarked that, though he had been a consultant in many of the fatal cases, "in his own practice he had had no case of puerperal
fever." Furthermore, he had consulted with Dr. Flint, whose puerperal fever cases had been reported at the previous meeting, and took charge of his midwifery patients after Flint left town, presumably because of the outbreak in his practice. "They all did well," Channing added. Thus, despite the persuasiveness of Holmes's data, the experience of individual physicians made it difficult to accept his conclusions.

At a meeting in March of the following year, Channing read a prepared paper "containing several facts to show that puerperal fever is not always contagious." It is unfortunate that the manuscript for the paper does not exist, for it would help us know exactly what facts Channing referred to. But there is no question that there were many examples in which a physician had a single case of puerperal fever in an otherwise busy midwifery practice. The minutes of the meeting reveal only Channing's comment that "from his own experience he would never hesitate to visit other patients and take charge of women in labor, when attending puerperal fever cases as consulting physician." Consulting physicians did not necessarily examine puerperal fever patients; they observed and offered opinions.

Channing's experience in Charlestown, as well as his experience with Dr. Flint's patients, wherein none of his own patients became ill, substantiated his position. Holmes, however, did not accept this reasoning. Though he had admitted that the contagion of puerperal fever was not always followed by disease, and that there might be some forms of the disease that were not contagious, he would not have a member of the medical profession risk a single woman's life.

The more Channing considered Holmes's theory, the more it seemed correct. He had no doubt of the similarity of puerperal fever and erysipelas. Too many physicians who had been ill with erysipelas themselves, or had attended erysipelas patients, had subsequent obstetric cases in which the woman, and sometimes the infant, died. During a serious outbreak in 1849, he became aware of a physician who had attended a case of phlegmonous erysipelas and afterward lost four puerperal patients, one after the other. At Channing's suggestion, the Society for Medical Improvement asked him, Dr. David Storer, and Dr. Charles Putnam to collect further data about physician responsibility for transmission of puerperal fever and better ways of treating the disease. The committee polled their colleagues, asking whether erysipelas, scarlet fever, and measles had occurred in their practices or their localities simultaneously with puerperal fever; whether puerperal fever had been contagious; and whether physicians called in consultation had communicated the disease. Questions such as these would not have been asked prior to Holmes's paper.

As responses came in, a misperception occurred that threatened to damage
Channing's reputation. All the recent cases were rumored to be his! He wrote immediately to the editor of the *Boston Medical and Surgical Journal*, refuting the attribution. "It so happens that I have not had a single case of this disease in my practice and so have lost none... I have seen in consultation some cases of puerperal fever, and this more than once, but have in no instance communicated the disease." He had become increasingly cautious, as well as defensive, avoiding puerperal fever consultations as much as possible and refraining from entering the sickroom if he could do so. He also made sure that the nurses who assisted in his cases and remained with the woman after delivery changed their clothing frequently. Like many physicians in Boston, he was fearful "of conveying that certain something" which proved disastrous to parturient women.

Holmes's paper, published as it was in a fledgling journal that expired within a year, did not produce the acclaim he might have wished for it. Although some physicians such as Channing were gradually persuaded, there was disbelief and antipathy from others who were angered by the accusation of a young practitioner that they might be transmitting disease to women they thought they were helping. Holmes's lack of expertise in obstetrics made him an easy target. His paper was roundly attacked by Charles D. Meigs and Hugh L. Hodge, both well-respected professors of obstetrics in Philadelphia.

Hodge indignantly assured his students that they could never be "the minister of evil," that they could never "convey, in any possible manner, a horrible virus so destructive in its effects and so mysterious in its operations as that attributed to puerperal fever." Meigs characterized Holmes's essay as "the jejune and fizenless dreamings" of a sophomoric writer and told his medical students that he preferred to attribute puerperal fever "to accident, or Providence, of which I can form a conception, rather than to a contagion of which I cannot form any clear idea." Again, in retrospect it is easy to accuse the noncontagionists of stupidity, but we must remember that these were physicians who could not accept an explanation that discredited their profession yet had no scientific theory to support it.

Holmes responded to these and other attacks by republishing his paper in 1855, with a different title and an introduction that stoutly defended his theory against the Philadelphians' disparagement. "I am too much in earnest," he wrote with zealous fervor, "for either humility or vanity, but I do entreat those who hold the keys of life and death to listen to me also for this once... I beg to be heard in behalf of the women whose lives are at stake, until some stronger voice shall plead for them."

The reappearance of Holmes's essay made a greater impact than the original paper. The attention it now received prompted Channing to send com-
ments to the *Boston Medical and Surgical Journal*. Using examples from his practice and those of several colleagues, plus citations from the British writers whom he particularly admired, Channing affirmed the contagious nature of puerperal fever, its likely transmission by physicians, and its strong correlation with erysipelas. He suggested that the accepted therapeutic modalities, bleeding and strong drugs, be replaced by sulfate of quinine, which had been successfully used by a colleague and was becoming more popular in general medicine. But he could not refrain from asking the fundamental questions that continued to perplex him. "Whence the *first case*?" What is the "specific cause which is nothing else, and can be nothing else than itself?" The second, third, and fourth cases could be explained by transmission from patient to patient via the physician, but what initiated the string of cases? The answer, Channing said, "has in it the whole history of a contagious disease." His questions remained unanswered and unanswerable until bacteriology explained the specific cause of the first case.

He had come to a full realization that "the whole profession, at whatever sacrifice it may be required, [must] be ready to do all in its power to prevent the communication of so fatal a malady." Many years later, when Oliver Wendell Holmes referred to Channing as having "the open and receptive intelligence belonging to his name as a birthright," he may well have been referring to the evolution of Channing's ideas about puerperal fever.