When Childbirth Was Natural, and Deadly

Druin Burch | January 10, 2009 06:18am ET

Today we grow concerned about birth not being natural enough, having become too medical. Historically it was thoroughly natural, wholly unmedical, and gravely dangerous. Credit: Dreamstime

Have you ever had that stubborn feeling that the natural world reflects your mood and your mind? The sun shines when you are happy and disappears when you are glum. Your own vitality — or lack of it — seems reflected in nature. That form of thinking is often called the "sympathetic fallacy."

"It appears to me impossible that I should cease to exist, or that this active, restless spirit, equally alive to joy and sorrow, should only be organised dust."

So wrote the English feminist Mary Wollstonecraft as the eighteenth century drew to its politically explosive end. Defying danger and convention, she was traveling with her illegitimate child around Scandinavia. Rowing herself along the Norwegian coastline, she wrote of looking into the sea at the strange jellyfish. "They look like thickened water. . . . Touching them, the cloudy substance would turn or close, first on one side, then on

the other, very gracefully; but when I took one of them up in the ladle, with which I heaved the water out of the boat, it appeared only a colourless jelly."

During the same period William Godwin, the radical philosopher and novelist, was clouded with gloom in the aftermath of the French Revolution. Not only did Britain seem to him a corrupt society — undemocratic, unfair, and unequal — but he believed that he himself, for all his wit and worldly success, was a fundamentally cold and unlovable man. Yet when Godwin read Wollstonecraft's dryly titled*Letters Written During a Short Residence in Sweden, Norway and Denmark*, he was ravished: "If ever there was a book calculated to make a man in love with its author, this appears to me to be the book."

And love was what followed. Theirs was a successful marriage of contraries, the fiery and intemperate feminist and the icy philosopher. Suddenly there was fertile happiness for both. At the end of August 1797, Godwin wrote, Mary "was taken in labour." Attended at home by a midwife from a nearby hospital, she gave birth eighteen hours later to a girl. The baby, also called Mary, would grow up to marry the poet Shelley and write the novel *Frankenstein*.

Four days after the birth, however, Wollstonecraft became feverish. A part of her placenta needed to be pulled out by a doctor's hand. She developed puerperal sepsis, an infection of the genital tract, which very painfully, and over the period of about a week, killed her.

Today we grow concerned about birth not being natural enough, having become too medical. Historically it was thoroughly natural, wholly unmedical, and gravely dangerous. Only from the early eighteenth century did doctors begin getting seriously involved, with obstetrics becoming a medically respectable specialty and a rash of new hospitals being built. Unfortunately, the impact of both was bad. Puerperal, or childbed, fever was a mystery, but both doctors and hospitals made it worse. Wherever the medical men went the disease grew more common, and in their hospitals it was commonest of all.

Childbed fever killed at the cruelest moments. It was described as a "desecration," an aspect of the natural world that felt almost deliberately evil. What caused it? Some thought "a failure of uterine discharge"; others, a little later, called it "milk metastasis," noting that the internal organs of the women who died seemed covered in milk. Eventually it was accepted that the fluid was not milk at all. It was pus.

Compound microscopes had been developed in the seventeenth century, opening up the world of miniature "animalcules." Inexplicably, an initial flurry of medical interest quickly died away. Even though the technology was now in place to help demonstrate it, germ theory took another two hundred years to arrive. In the meantime doctors were puzzled, blaming puerperal fever on a host of different causes: mists, sewage, poor ventilation, cold, or vague "putrid tendencies."

In 1791, the year Wollstonecraft and Godwin first met, an epidemic of puerperal fever was ripping through Scotland. Alexander Gordon was Aberdeen's leading obstetrician, and when puerperal fever came along he studied it and wrote down his conclusions. They amounted to what he felt were three great truths: the disease was spread by doctors and midwives; it was somehow related to skin infections; and the only treatment was bleeding — by the bucketload. A pint and a half was a good initial measure.

Bleeding was quickly and incorrectly accepted as a cure, but it took almost a century for the contagious nature of puerperal fever to be widely recognized. Many cases were isolated and sporadic, undermining those who argued the disease was infectious. At other times its epidemic nature was clear. William Campbell, another Scot, was a close contemporary of Gordon's. He first denied the contagiousness of puerperal fever, but personal experience changed his mind. He dissected the corpse of a woman killed by the disease, putting her uterus in his coat pocket so that he could show it to his students. He felt neither gloves nor hand washing was needed.

"The same evening," he wrote, "without changing my clothes, I attended the delivery of a poor woman in the Canongate; she died. Next morning I went with the same clothes to assist some of my pupils who were engaged with a woman in Bridewell, whom I delivered with forceps; she died."

Campbell's language, as well his report, is a reminder that no one then spoke of delivering a baby. Obstetricians and midwives talked of delivering *women* — delivering them from the peril of childbirth.

In the first half of the nineteenth century about five European women in a thousand died from childbirth. Death rates in maternity hospitals were often ten times that; the hospitals stayed open because doctors had an incurable faith in good intentions, and patients a poor grasp of mortality statistics. The physician and poet Oliver Wendell Holmes led the American campaign to stop the spread of the disease by getting doctors to wash their hands. Obstetricians felt slighted. "Doctors are gentlemen," said Charles Meigs of the Jefferson Medical College in Philadelphia, arguing that no such care was needed, "and gentlemen's hands are clean." How could the pure of heart possibly be

spreading disease? For Meigs and many others, noble intentions mentally equated to good outcomes. It would be hard to find another example of the sympathetic fallacy with such far-reaching and tragic consequences. Yet hand washing slowly grew commoner. Aided by Louis Pasteur's advocacy of germ theory, hygiene improved. Giving birth began to get safer.

A few different organisms turned out to be capable of causing puerperal fever, but the vast majority of cases were due to just one: *Streptococcus pyogenes*. The etymology is revealing. *Pyogenes* means creator of pus. The bacterium lives only on humans, and consists of roughly 1,800 genes, a third of which "have no identifiable function," according to a 2001 paper reporting one complete genome sequence of the bug. Of the genes we partially understand, around forty seem directly connected with the virulence of the organism. *S. pyogenes* causes a range of other diseases, including strep throat, scarlet fever, rheumatic fever, and skin infections such as mild impetigo and catastrophic necrotizing fasciitis (now commonly called the "flesh-eating disease"). Epidemics of puerperal fever historically matched those of skin infections, and a person who contracted one was able to pass along the other.

Why should it be in a germ's interests to make us ill at all? In most cases, the illness is simply a consequence of the germ hijacking and disturbing our metabolism in order to reproduce. Other times our misery is an essential part of the way our invader spreads, as when a virus causes us to sneeze out millions of aerosolised copies of itself.

Streptococcus pyogenes is harder to understand. It might be named for causing pus, but that is misrepresentative. As far as this bacterium is concerned, Eden is the inside of our noses. Anywhere between 5 and 20 percent of us are harmlessly inhabited by the bug at any time. The nineteenth-century head of Paris's main maternity hospital thought Pasteur must be wrong in attributing puerperal fever to a bug so common: "It exists everywhere," he objected, "you can very easily extract it from the common water supply, and in consequence there is not a woman in childbirth who, daily using this water for drinking, douching, and washing, would escape invasion by the infectious organism."

We know that Pasteur and the germ theorists were right, but the mysteries that slowed their intellectual victories still exist. Why should such a generally harmless bug sometimes become troublesome? Today we might phrase the question differently: why should it be in the evolutionary interests of a bacterium to leap from docility into rampaging ferocity? What's in it for the bug? Sporadic cases might be chance, but trends suggest an evolutionary imperative.

Joseph J. Ferretti, a University of Oklahoma specialist in streptococci, notes that *S. pyogenes* has some remarkable qualities, containing "more virulence-factor genes than any other bacterial species." Moreover, he says some strains possess genetic switches for hypermutation, which increase mutation rates over a hundred-fold. We are a long way from fully understanding how all these virulence mechanisms work. And that makes it even more difficult to explore the deeper questions about how evolution is driving them.

Puerperal fever has never entirely gone away. Sporadic cases still appear — rare, potentially lethal, but now easily treatable with antibiotics if caught in time. Epidemics, however, have mysteriously vanished. The last was in Boston, in 1965, an enigmatic outbreak after an anesthesiologist scratched his hand on a rosebush. (*S. pyogenes*does not live on roses.) Hygiene, asepsis, and antibiotics seem only partly to thank. Some argue that something in the bacterium itself has shifted, that it has evolved to become more benign. It could be that a less damaging form spreads more successfully by virtue of not killing its hosts, or that it becomes more efficient by not needing to manufacture virulence factors.

Today the standards of asepsis in normal births have slipped. Most normal deliveries are clean but not sterile: a step away from the strict standards that would be required of an operating theater. My first child was born during the writing of this essay, and that was exactly the case. Mother and baby did brilliantly.

Certain types of *S. pyogenes* infections are currently on the rise, but puerperal fever is not. Unable to fully understand the way it has behaved till now, we are stumped when it comes to facing it in the years to come. Has its virulence really declined? Why might that be? And why should it be so for puerperal fever but not for other streptococcal infections? Without firm answers, we cannot understand how the disease might evolve, or what dangers it might hold for our future.

Tackling those questions requires us to stop viewing the world from our own perspective and see it from that of the bacterium. It is a point of view we are still remarkably ignorant about. We are like Mary Wollstonecraft leaning over her boat, looking into the water — able to describe what we see, but more with puzzled wonder than with comprehension.

Druin Burch is a medical resident and a tutor at the University of Oxford. His first book, Digging Up the Dead (2007), profiles the pioneering surgeon Astley Cooper; his second, Taking the Medicine, is due out in 2009.