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Ignaz Semmelweis and the Scientific Attitude

In 1846, Puerperal fever, also known as “Childbed fever”, was an incredibly deadly disease that afflicted birthing mothers. It had a mortality rate of 10-35%. Even today, Childbed fever accounts for about 15% of all maternal deaths. However, it was also in 1846 that a physician named Ignaz Semmelweis discovered that hand washing could save lives after conducting a test in the maternity ward of the Vienna General Hospital that he worked in. His experiment and his thought process display wholesale the key tenets of the Scientific Attitude–to base any theory on empirical evidence, and to be willing to change a theory if the results contradict the theory. Semmelweis’s work ethic was astoundingly ahead of its time, as very few if any doctors were willing to do these things–the Scientific Attitude hadn’t yet ingrained itself in the field of medicine. In 1846, hospitals still did not have many of the advances of modern medicine–there was no Antisepsis, anesthesia, or germ theory of disease. As such, Semmelweis’s story also highlights what a scientific field without the Scientific Attitude is like.

Ignaz Semmelweis was born in 1818 in present-day Budapest, Hungary. He got a medical degree in Vienna in 1844 and was soon after sent to work at Vienna General Hospital, the hospital with, at the time, the largest maternity clinic in the world. Immediately, there was a huge problem–Puerperal fever was rampant. However, Semmelweis noticed something odd. Vienna General’s maternal clinic was split into two wards–ward 1 and ward 2. In ward 1, the rate of Childbed fever and death was as high as 29%, but in ward 2, the death rate was closer to about 4%. In addition, Semmelweis noticed that mothers who delivered at home or even on the way to the hospital also experienced much lower rates of Childbed fever. Semmelweis wondered what made ward 1 so different.

Semmelweis decided to run many experiments to determine what caused only the first ward to have a high death rate. First it was thought overcrowding might be the issue, however Semmelweis counted and found that ward 2 was actually much more crowded than ward 1. Then he tried telling the priest summoned to give last rites to women dying of the fever to take a faster, quieter route to the ward 1’s sickroom, but that did nothing. Various other tests were conducted, including laying women on their sides or their backs. Eventually, it was noted that one big difference between the two wards was that ward 1 had medical students handle deliveries, and ward 2 used midwives. When Semmelweis had them change places, the death rate followed the students. Now he had to figure out why. In 1847, Semmelweis’s good friend and an examiner, Jakob Kolletschka, died after a surgeon accidentally poked him with a scalpel

during a postmortem examination of a woman who died of Childbed. Kolletschka's own autopsy revealed symptoms incredibly similar to those of Childbed fever–and it was here that Semmelweis had a breakthrough. He immediately proposed that he and the medical students carried "cadaverous particles" on their hands from the autopsy room to the first ward, and these particles are what infected the mothers. He also proposed that the reason ward 2 had so little deaths was because the midwives working there were not involved in autopsies. He proposed that the students should wash their hands after autopsies using a solution of chlorinated lime in order to eliminate the particles and the smell of the particles possibly causing this disease. The result was tremendous–in a two month long controlled experiment, the death rate shot down to about 2%, and that August, not one woman died of Childbed fever in ward 1.

It is clear how Semmelweis's actions exemplify the Scientific Attitude. Semmelweis repeatedly observed the situation between the two wards and learned what he could. His theory was based on many observations–his friend's death, what the medical students were doing–and he repeatedly changed his hypothesis when one was snuffed out by evidence, leaving himself open to learning new information. These things match the two pillars of Scientific Attitude–to base a theory on natural observation, and to be willing to change a theory if it is contradicted by results. Semmelweis was incredibly ahead of his time–though that also came with many consequences. His superiors failed to understand him, and his findings were contrary to popular medical theory at the time, and so ignored his findings for about two decades. They thought it incredulous that somehow this was the "gentlemanly" medical students' fault, and Semmelweis was fired. He spent the next six years back in Budapest as a professor, during which time the Hungarian Revolution would upend his career. In 1861 he would publish his findings, but in 1865 his mental health had deteriorated to the point where he was admitted into an asylum, in large part due to his constant fights with "old guard" doctors who fumed at his work. One can clearly see the reverse side of the Scientific Attitude in the attitude of these doctors–soundly rejecting Semmelweis's work even after seeing the evidence and the work he did, and sticking closely to old practices like Miasma and the Four Humors. It was only years after his death, with the invention of the microscope and the discovery of germs, that Semmelweis would be credited as the father of modern cleanliness.

Ignaz Semmelweis demonstrated a truly revolutionary Scientific Attitude for his time. He based his theories on evidence he gathered, he demonstrated a willingness to change his theory when it was refuted by the evidence, and he always persisted until he could find a link. However, his story is also a showcase of a radically different scientific field–one without the Attitude. A field

where old ideas with no proof were accepted and new ideas were quashed. A field where people died as a result. Ignaz Semmelweis was truly ahead of his time.