Pioneer Science and the Great Plagues
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cow. As Jenner’s method became widespread, critics called him a criminal and money grabber who had duped both the medical community and Parliament. Scratching smallpox scabs into a healthy person was seen as a way to cause disease, not prevent it. Sanitarianism, the “atmospheric” and “vapors” theories of disease causation, made it clear that the removal of “filth” was the way to prevent disease. There was no concept of specific causes for disease.

There were serious drawbacks to vaccination. The small vaccination scarifications, if not kept clean, could harbor bacteria that caused tetanus that killed the patient. Syphilis was another concern. In early vaccinations, it was the custom to use scab material from the arm of a recently vaccinated person to vaccinate another, and there were rumors that syphilis had been transferred at the same time.

Public fears that this new “vaccination” would cause bad things was driven by an anti-intellectual culture and anti-science prejudice. Gossip expressed in the press led to panic and fear of unfounded dangers. Anti-vaccination societies formed in both Britain and France. Developing hostility on the basis of misinformation, they dissipated their anger in caustic ways. Panic was promoted by anti-vaccination zealots. The anti-vaccination movement would be alive for nearly a century.19

3. WILLIAM DICK: FROM FARRIER TO VETERINARIAN IN EDINBURGH

As improbable as it seems, much of North America’s early heritage in veterinary medicine originated from the knurled hands of Scotsman John Dick, an extraordinary farrier in Edinburgh. The earliest British farriers were both blacksmith and horseshoer; using cast iron, they built the shoe and shod the horse. Some also served as veterinary nurses, providing amateur diagnoses and dispensing crude treatments. In the British Army, farriers were responsible for euthanasia and keeping records of horses put down, a duty little changed from that of the farriers of the English Crusaders in the twelfth century. In today’s ceremonial parades, the British Army farrier marches behind bearing the symbol of his trade, the farrier’s ax, an instrument with a spiked end used to produce a lethal blow to the head and a blade to cut off the foot of the dead horse for military records.
As iron horseshoes became commercially available, the art of the farrier shifted from blacksmith to focus on correcting lameness and putting down horses that could not survive. Good farriers had the skill to pinpoint the cause of abnormal gaits and the ability to see that horses were shod correctly. A prime attribute was the ability to provide corrective shoeing for lameness and diseases of the hoof. Diagnosis of abnormal gaits required the skill to see and hear subtle defects in real time and the analytical ability to provide proper horseshoes.

As was the custom in Scotland, farrier John Dick gave advice on diseases of the horse. He was blacksmith, farrier, and amateur veterinarian, even doing minor surgery such as tenotomy—and he passed his skills to his young son William. An inquisitive boy, William Dick attended night classes at the University of Edinburgh in chemistry, physics, and anatomy. He received permission to attend anatomy lectures in the Edinburgh medical school at No. 10 Surgeons’ Square. The professor of anatomy, John Barclay, MD, was impressed with young William and invited him into his lectures on anatomy. Perhaps he was also interested in William’s knowledge of horses—Barclay was a comparative anatomist with a strong interest in horses and agriculture and a director of a Scottish agricultural organization, the Highland Society. Medical students in Barclay’s class, disgruntled at the attention given to Dick, complained that he was “but a common blacksmith.” Barclay’s response was, “Well, well . . . all I can say is, that whether he be a blacksmith or whitesmith, he’s the cleverest chap among you.”

Finishing the Barclay lectures, Dick took the “lang road coach to London” to attend the lectures of Professor Edward Coleman, principal of the London Veterinary College. In London for only three months, he was granted a veterinary diploma in January 1818 and returned to Edinburgh.

Dick began a series of lectures in veterinary science at the School of Arts of Edinburgh Monday through Thursday. The initial lecture was given in the presence of the Veterinary Committee of the Highland Society. There was no salary. In the first lectures of 1821, seventeen farriers attended. In the next season of forty-six lectures there were twenty-five students, and by 1832–1833 there were fifty students.

Supported by Barclay, Dick started his own school for veterinarians in a building near his father’s forge on Clyde Street. Rudimentary and scattered with anatomical specimens, it seemed to one visitor to be a cluttered “appendage of a forge” with “skeletons of all descriptions . . . standing higglety-pigglety”
throughout. First known as the Highland Society’s Veterinary School, its graduates received their certificate from the Highland Society stating they were “qualified to practise the veterinary art.”

Dick’s thriving practice was incorporated into his school, and during the next decade both prospered as a clinic for treating lame and sick horses. A new school building was constructed in 1833 that included more space and a miniature version of the traditional medical amphitheater, wherein students looked directly down on Dick in action. Later, as Professor Dick, he was credited with the ability to sit in his second-floor office and diagnose lameness by listening to the claps of a horse trotted on cobblestones in the street below.

The importance of all this is that at the time of William Dick, English veterinarians were emigrating to North America, and many of them were poorly educated in London. Turns out, the inspiration for American veterinary education and science came not from London but from the back room of a forge in Scotland. In his long career, Dick mentored and bequeathed seven extraordinary men who would found veterinary schools throughout the world—including three in North America: Andrew Smith in Toronto, Duncan McEachran in Montreal, and James Law at Cornell University in New York—each bearing the gift of Dick’s extraordinary clinical skill, his knowledge of science, and his talent skill as an educator.

4. THE SCIENCE GIANTS OF 1860: PASTEUR, VIRCHOW, AND DARWIN

In the 1860s there were three European giants in the fields of biology and medicine. Their discoveries had been made in a short five-year span just before the American Civil War: in France, the chemist Louis Pasteur discovered alcoholic fermentation, microbial spoilage of wine and milk, and pasteurization (1857); in Germany, the medical pathologist Rudolf Virchow established the cell as the basic unit of life and disease in his book *Cellular Pathology* (1858); and in England, Charles Darwin changed science forever with his *On the Origin of Species* (1859). Late in their careers, all three had astonishing impacts on science through investigating animals—their experiments were veterinary science, and veterinarians contributed to and capitalized on their discoveries.