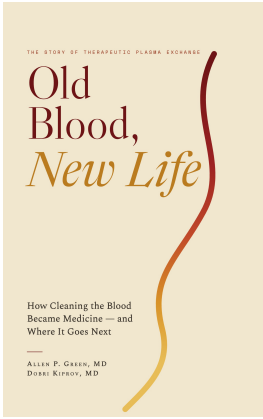

Old Blood, New Life

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Sample chapter

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The Long Era of Bloodletting

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CHAPTER 3

Bleed to Heal: The Long Era of Bloodletting

When Bloodletting Was Medicine

On the morning of Saturday, December 14, 1799, the most famous man in America lay propped in his bed at Mount Vernon, fighting for breath, and asked to be bled. He had ridden out the day before in snow and freezing rain to inspect his farms, come home soaked, and woken in the small hours with a savage soreness in his throat and a growing inability to swallow or speak. Before any physician arrived, George Washington had an overseer open a vein in his arm and draw off the better part of a pint, and when the man hesitated, the old general, who had trusted bloodletting his whole life, pressed him to take more, over his wife Martha's objections.[32]

Over the hours that followed, three of the most respected physicians in the young republic gathered at his bedside, and they bled him again, and again, and again. By the time he died that night, somewhere between ten and eleven o'clock, they had drawn off in the vicinity of eighty ounces of blood, on the order of forty percent of everything in his body, in a single day.[33] They had also blistered his throat with a caustic of Spanish fly, swabbed it with a preparation of dried beetles, dosed him with the mercury compound calomel and an emetic to make him vomit, and tried to pour a mixture of molasses, vinegar, and butter down a throat so swollen he nearly choked on it.[34] The youngest of the three doctors, Elisha Cullen Dick, argued against the final, heaviest bleeding and proposed instead a

tracheotomy, cutting an airway directly into the windpipe, to relieve the obstruction. He was overruled. Later physicians have judged that he was probably right.[35]

Washington's doctors called his illness *cynanche trachealis*, an inflammation closing off the upper windpipe. Modern physicians, looking back, mostly diagnose acute epiglottitis, a bacterial swelling of the flap of tissue at the base of the tongue that can seal an airway shut within hours.[36] The bloodletting almost certainly did not kill George Washington. The swelling in his throat was going to take his life regardless; no one in 1799 possessed a treatment that could have saved him.[37] But it did not help him, and the loss of nearly half his blood, on a day his body was desperate for every ounce of oxygen that blood could carry, made his last hours harder.

That is the whole tragedy of bloodletting in a single deathbed, not a fringe superstition inflicted by quacks but the considered, conscientious treatment of choice, delivered by the finest physicians available, to a willing and even insistent patient, in a case where it could do no good and quite possibly some harm. To understand how the leaders of a nation came to drain their first president like that, and to feel why they did it without cruelty or stupidity, we have to look at the two thousand years of medicine standing behind that bed.

The most mainstream medicine in history

It is tempting to picture bloodletting as something that happened at the disreputable margins of medicine. The opposite is true. For most of recorded Western history, bloodletting *was* medicine, the central, respectable, first-line therapy, prescribed by the most learned physicians for the widest possible range of complaints. It followed, as we saw in the last chapter, with the force of logic from the humoral theory. If illness was an excess or corruption of the humors, and if the blood was the most accessible of them, then drawing blood off was the most direct way to restore balance.

And the idea was not confined to the West. India had arrived at it independently, and turned to the same instruments: venesection, cupping, and the leech.

The methods were essentially three. There was venesection, or phlebotomy, opening a vein directly, usually at the elbow, with a small sharp blade called a lancet, or a spring-loaded device called a fleam. There was scarification combined with cupping, scratching the skin and applying a heated glass cup whose cooling created suction to draw blood to the surface, the "wet cupping" still practiced in parts of the world today. And there was the leech.[38] So thoroughly did the lancet symbolize the whole enterprise of medicine that when a crusading London surgeon founded what would become the world's most prestigious medical journal in 1823, he named it, with deliberate double meaning, *The Lancet*.[39]

The work itself was often delegated. In medieval and early-modern Europe, university-trained physicians diagnosed and prescribed but frequently considered the actual cutting beneath them, so the task of bloodletting fell to barber-surgeons, tradesmen who cut hair, pulled teeth, and opened veins in the same establishment. Their trade has left a mark we still see on the street. The red-and-white striped barber's pole is widely held to descend from this work, the red standing for blood, the white for the bandages or tourniquet, the pole itself for the staff a patient gripped to make the vein in the arm stand out.[40] Barber and surgeon were formally joined in trade companies for centuries before the two professions finally separated.

The leech, and its strange immortality

No instrument of bloodletting has had a stranger career than *Hirudo medicinalis*, the European medicinal leech. The very word *leech* carried, in older English, the meaning of *physician*, the healer and the worm sharing a name so closely that etymologists still argue over whether the two senses sprang from one root or merged from two.[41] To be treated by a leech, for much of history, was simply to be treated.

The leech reached the height of its prestige in the early nineteenth century, in an enthusiasm that now reads as mania. In France, an influential physician named François-Joseph-Victor Broussais taught that nearly all disease came down to inflammation of the gut and could be answered with aggressive leeching, and the fashion he set

consumed leeches by the tens of millions; France is reported to have imported enormous quantities each year to keep up with demand, harvesting the wild populations toward collapse.[42]

And then the leech did not stay buried. *Hirudo medicinalis* is back, not as folklore but as rigorous, regulated medicine. In 2004 the United States Food and Drug Administration formally cleared medicinal leeches as a medical device.[43] Reconstructive and microsurgeons use them today to rescue reattached fingers and tissue flaps that are dying of venous congestion, blood flowing in through the arteries but unable to drain out through the delicate, not-yet-healed veins. A leech relieves the back-pressure and, through anticoagulant compounds in its saliva, keeps the blood flowing long enough for the body to grow new drainage. The ancient creature earned its way back not on tradition but on evidence, which is precisely the journey the larger idea of cleansing the blood is now making.[44]

Why it sometimes worked

The question that makes bloodletting interesting rather than merely cautionary is this. If it was so wrong, why did intelligent physicians, observing real patients for two thousand years, keep concluding that it worked?

Part of the answer is that, for a narrow band of conditions, it actually did, and still does. There are diseases in which the body truly carries too much blood, or the wrong thing in it, and removing some is therapeutic. In hereditary hemochromatosis, the body loads up dangerously with iron, and the standard treatment to this day is to draw off blood at intervals to bleed the excess iron away. In polycythemia vera, the marrow makes too many red cells and thickens the blood toward sludge, and again the treatment is regular phlebotomy.[45] In acute heart failure with the lungs flooding, reducing the blood volume can ease the load on a failing heart, a logic that survives, in gentler form, in modern diuretics. The humoralists had no idea *why* these patients improved, but improve some of them did, and every success reinforced the theory.

The rest of the answer is subtler and just as important. Drawing blood produces immediate, dramatic, felt effects: a drop in blood pressure, a wave of light-headedness, sometimes a faint, often a strange calm. To a feverish, agitated patient, that sedation could feel like relief. Removing blood may also, in inflammatory states, carry off some measure of the very inflammatory mediators we will spend Part Two cataloguing, a crude, blind version of a real effect. And surrounding all of it was the architecture of ritual: a respected authority, a solemn procedure, a visible substance removed, a strong expectation of benefit. We have a clinical name now for the power of that architecture, the placebo response, and it is large and well documented. A treatment can make people feel better for a while without doing them any biological good at all.[46]

So bloodletting persisted because it sat on a small foundation of real benefit, surrounded by a large scaffold of illusion, and its practitioners could not tell the two apart, because they had no way to measure outcomes across many patients. They had anecdotes, authority, and a theory that explained everything. What they lacked was arithmetic.

This is the thread to carry forward, because it is the hinge of the whole book. Bloodletting was not wrong because the blood doesn't matter. It was wrong because it removed blood *blindly*, the whole of it, cells and fluid together, by guesswork, in conditions where nothing needed removing and often in catastrophic excess. The kernel buried inside the error, that you can treat disease by taking something harmful out of the circulation, was real. What was missing was the knowledge of *what* to remove, and the precision to remove only that. Two centuries later, an apheresis machine would separate the plasma from the cells, return the cells to the patient, and take away only the offending fraction. That is bloodletting's idea, finally given its tools. But we are getting ahead of the story.

The danger was always excess

Return, now, to the bed at Mount Vernon. The error was not in believing that something in the blood mattered to health. That belief was pointing at a real truth. The error was in acting on it blindly and

without limit, in drawing forty percent of a dying man's blood in a day, on the strength of a theory, with no way to know whether it was helping or harming, in a case where it could not possibly cure the swelling shutting his throat. The danger of bloodletting was never the underlying intuition. It was the absence of measurement, of mechanism, of any brake on excess.

And by 1799, the brakes were beginning, faintly, to appear. Martha Washington's instinct to stop the overseer's blade; the murmurings of popular doubt about the practice that the newspapers of the day already carried; young Dr. Dick's objection to the final bleeding. These were small tremors of a coming collapse. Within a few decades, in a Paris hospital, a physician with a notebook and a stubborn faith in counting would do to bloodletting what no philosopher ever had. He would simply tally up what happened to the patients, with and without it, and let the numbers speak.

Notes to Chapter 3

32. George Washington's final illness (December 14, 1799): eyewitness account by his secretary Tobias Lear and the physicians' report by James Craik and Elisha Cullen Dick (1799); modern reconstruction in Morens DM, "Death of a President," New England Journal of Medicine 1999;341:1845–1849. At Washington's own insistence the bleeding was begun by his overseer, Rawlins, before the physicians arrived, and he pressed for more over Martha Washington's objection.

33. Over the final day Washington was bled roughly four times for a total on the order of eighty ounces, about forty percent of his blood volume (estimates range from roughly a third to forty percent). Morens 1999.

34. Adjunct treatments included blistering with cantharides (Spanish fly), a throat swab of a dried-beetle (cantharides) preparation, the mercury compound calomel and a tartar (antimony) emetic to induce vomiting, enemas, and a tonic of molasses, vinegar, and butter. Morens 1999; eyewitness accounts.

35. Elisha Cullen Dick, the youngest of the three attending physicians, objected to the final, heaviest bleeding and urged a tracheotomy instead; he was overruled by the senior physician, James Craik. Tracheotomy is recognized today as potentially life-saving in airway obstruction but was regarded as radical and rarely successful in 1799. Morens 1999.

36. The contemporaneous diagnosis was cynanche trachealis (a throat-closing inflammation); the modern retrospective consensus favors acute epiglottitis. Morens 1999.

37. Modern assessments hold that the bloodletting was unlikely to have been the sole cause of death and that the airway obstruction was probably fatal regardless, since no effective treatment existed in 1799, while the heavy blood loss did not help and may have worsened his final hours. Morens 1999; commentary by Markel, Chaisson, and others.

38. The three principal methods of bloodletting: venesection (opening a vein with a lancet or a spring-loaded fleam), scarification combined with wet cupping, and the application of leeches.

39. The Lancet was founded in 1823 by the London surgeon and reformer Thomas Wakley, who named it with deliberate double meaning, after the

bloodletting instrument and after the "lancet" (pointed-arch) window, as an instrument to let in light.

40. The barber-surgeon trade combined haircutting, tooth-pulling, and bloodletting; the red-and-white striped barber's pole is widely held to derive from it (red for blood, white for the bandage or tourniquet, the pole for the staff a patient gripped to raise the vein). Barbers and surgeons were joined in trade companies for centuries before separating.

41. In older English, læce ("leech") also meant physician, and "leechcraft" meant medicine; etymologists debate whether the animal and physician senses share a single root or converged from two.

42. François-Joseph-Victor Broussais held that nearly all disease arose from inflammation (especially of the gut) and could be treated by aggressive leeching. The resulting "leechmania" drove French demand to the order of tens of millions of leeches a year in the late 1820s–1830s (about 33 million in 1827 and roughly 42 million by the early 1830s), depleting wild populations. See the Spanish–French leech-trade literature, Medical History 2024.

43. In June 2004 the U.S. Food and Drug Administration cleared medicinal leeches (Hirudo medicinalis) for marketing as a medical device, the application from the French firm Ricarimpex SAS (510(k) K040187).

44. In reconstructive and microsurgery, leeches relieve venous congestion in reattached digits and tissue flaps; anticoagulant compounds in leech saliva, including hirudin, keep blood flowing while venous drainage re-establishes.

45. Therapeutic phlebotomy remains standard care for hereditary hemochromatosis (iron overload) and polycythemia vera (overproduction of red cells).

46. On the transient hemodynamic effects of venesection (a drop in blood pressure, light-headedness, sometimes a strange calm), the possible carrying-off of some inflammatory mediators, and the role of ritual and expectation: the modern concept of the placebo response.