

# An Informal History of American Medicine from the Colonial Era through the 20th Century



# An Informal History of American Medicine from the Colonial Era through the 20th Century

By

Curtis E. Margo

**Cambridge**  
**Scholars**  
Publishing



An Informal History of American Medicine from the Colonial Era  
through the 20th Century

By Curtis E. Margo

This book first published 2023

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Copyright © 2023 by Curtis E. Margo

All rights for this book reserved. No part of this book may be reproduced,  
stored in a retrieval system, or transmitted, in any form or by any means,  
electronic, mechanical, photocopying, recording or otherwise, without  
the prior permission of the copyright owner.

ISBN (10): 1-5275-0460-3

ISBN (13): 978-1-5275-0460-8

Originally published as:

Glass Half Full. An Informal History of American Medicine

Copyright 2009 Curtis E. Margo

Clio Mentor, Tampa, FL

Library of Congress Control Number: 2009925250

ISBN: 978-0-692-00287-2

Printed in the United States of America

*To Lynn*



# CONTENTS

Preface .....	xix
---------------	-----

Foreword Second Edition .....	xxiii
-------------------------------	-------

Chapter 1 .....	1
-----------------	---

## The Colonial Landscape

Medical practitioners in colonial America consisted of an assortment of healers whose approach to the treatment of disease varied considerably based upon background or training. Men graduating from European medical schools may have expected to take a leadership role in the medical community, but found their authority effectively challenged by a host of alternative healers.

Indigenous People

Medical Organization

The Ministry

Surgery

Druggists

Miscellaneous Healers

“Real” Doctors

Early Hospitals

Chapter 2 .....	15
-----------------	----

## Smallpox

The Boston smallpox epidemic of 1721 pitted the Puritan minister and “amateur” physician Cotton Mather against the medical community over the use of variolation. Mather lost the battle over protective inoculation, but the medical profession in its victory displayed hubris and fallibility.

Smallpox

The Epidemic of 1721

Polarization

Cotton Mather

Witch Trials

Epidemic Burnout

Inoculation

## Chapter 3 ..... 27

## Western Medical Tradition

The origin of American medical orthodoxy goes back to the ancient occupation of Hippocrates and Galen. The survival of orthodox medical practice in the United States during the nineteenth century was at times doubtful because physicians had little more to offer the sick than did charlatans or quacks.

Inspiration

Hippocrates of Cos

From Greece to Galen

The Caduceus

Enlightenment

## Chapter 4 ..... 40

## The First Medical School

The first medical school in America started as a reverie of John Morgan and William Shippen, two friends who became famous enemies. Morgan lived to see the high academic standards he established at the Medical College of Philadelphia dismantled because of the economic realities of American society.

Morgan and Shippen

Training Abroad

Travail in Philadelphia

The War of Independence

Oil and Water

Looking Ahead

## Chapter 5 ..... 52

## Benjamin Rush

Benjamin Rush was an American patriot and the most influential physician of his era. He was a social activist who advocated humane treatment for the mentally ill and equal opportunity in education. As an influential medical theorist, he mistook conjecture for fact and demonstrated no insight into scientific reasoning.

Early Life

Professor of Chemistry

War of Independence

The New Nation



Chapter 6 ..... 59

The Epidemic of 1793

Benjamin Rush perfected “heroic therapy” (heavy bloodletting and purging) during the yellow fever epidemic of 1793 in which a tenth of the inhabitants of Philadelphia died. His treatment of seriously ill patients cast a dark shadow over his professional career and made the public wary of medical doctors.

Putrid Fumes

Yellow Fever

Crisis

Doctor Vampire

Chapter 7 ..... 68

American Bloodletting

George Washington’s death was hastened by the use of therapeutic bleeding. His death (coincidentally) coincided with a defamation suit against the editor of the *Porcupine Gazette* for ridiculing the person of Benjamin Rush and his use of bloodletting. Rush won the defamation suit, but history credits laypersons with having greater insight into the harmful effects of bloodletting than leaders of the medical profession.

Recovery and Indignation

*Porcupine’s Gazette*

The History of Bloodletting

David Hosack

The Death of George Washington

Denouement

Chapter 8 ..... 82

Public Health for Profit

Benjamin Waterhouse, head of medical theory at Harvard, attempted to monopolize the use of the smallpox vaccination in New England in 1799. His attempt to restrict the use of this new technology for financial gain sparked the first public debate over the conflicting tenets of medicine and business.

Vaccination

The Boston Medical Society

Thomas Jefferson

Benjamin Waterhouse

Biotechnology

## Chapter 9 ..... 92

## European Symbiosis

American physicians were indebted to Europeans for their intellectual tradition. The scientific foundation of medical practice was painfully slow to evolve. The reciprocal relationship of scientific discovery and technology began to emerge during the Renaissance, but not until Rudolf Virchow formulated a valid and workable concept of disease could measurable progress be made in clinical medicine.

Rudderless Ship

Medical Thinking

Gross Anatomy

William Harvey

Spinoff Technology

Science and Technology

Microscopy

Medical Theorists

Clinical Practice

## Chapter 10 ..... 109

## Frontier Surgery

Ephraim McDowell, a country doctor without a medical degree, was an unlikely candidate to perform the first successful ovariectomy. After McDowell demonstrated the feasibility of pelvic surgery (and antisepsis and anesthesia made surgery relatively safe and painless), surgeons searched for a disease they could cure with ovariectomy. Hysteria was the perfect disorder.

Country Doctor

The Mother of Invention

Ovariectomy

Perspective

Hysteria

Chapter 11 ..... 121

The Medical Sect Movement

Samuel Thomson, a man with no formal education or gift of intellect, threatened organized medicine with his herbal medicine empire. The success of sectarian physicians occurred at a time when the orthodox medical profession was struggling to define itself.

The Provocateur

Itinerant Doctor

Pharmacy 101

The Rise of Thomsonianism

Herbal Empire

Road to Extinction

Chapter 12 ..... 136

The Rise and Fall of Homeopathy

Homeopathic physicians effectively competed with regular physicians for patients because they offered alternative treatments that were mild and well tolerated. Neither allopathic (regular) nor homeopathic doctors could effectively cure disease, but the therapies of regular doctors were harsh and often harmful.

Competition

Homeopathy

Hahnemann Medical College

Evolutionary Convergence

The Death of Garfield

Assimilation

Chapter 13 ..... 147

The American Medical Association

The American Medical Association was founded in 1847 when the medical profession was weak and insecure. Members of the AMA distinguished themselves from sectarian practitioners in their commitment to a code of ethics and dedication to high educational standards. The AMA used its code of ethics to gain an advantage over other healers, but in so doing stirred up more controversy than it anticipated.

Medical Licensure

Founding of the AMA

National Medical Convention

Isaac Hays  
 The Code  
 Ignore or Attack?  
 Fledgling Society  
 Specialization

Chapter 14 ..... 164  
 Civil War Medicine

Nearly twice as many lives were lost to disease during the Civil War than to battlefield injuries. The Surgeons General of the North were more concerned about maintaining their independence from civilian authority than delivering quality medical care. The situation could have been worse if the Sanitary Commission had not demanded the Medical Department of the Army be held accountable for its performance on the battlefield.

Life and Limb  
 Weapon Technology  
 Communicable Diseases  
 The Sanitary Commission  
 Court-Martial  
 The Ambulance Corps  
 Army Surgeons  
 Death of Lincoln  
 Office of the Surgeon General

Chapter 15 ..... 187  
 John Shaw Billings

Regarded as medicine's greatest unsung hero, John Shaw Billings created the National Library of Medicine, and the *Index Medicus* and *Index-Catalogue*. As the intellectual force behind the design and construction of Johns Hopkins Hospital, John Shaw Billings ushered post-graduate medical education into modernity.

Desk Job  
 The *Index-Catalogue*  
 Johns Hopkins  
 Building a Hospital  
 Johns Hopkins School of Medicine  
 Institution Builder  
 No Political Enemies

Chapter 16 ..... 204

The Mayo Clinic

William and Charles Mayo had all the qualities that made them leaders in the field of surgery. Their illustrious careers were founded upon hard work and common sense, but the creation of the multi-specialty group practice may be their greatest contribution to medicine.

Westward Expansion

Horse-and-Buggy Practice

Brother Doctors

Family Practice

Henry Plummer

Laboratory Medicine

American Success Story

Thyroid Disease

Group Practice

Chapter 17 ..... 225

George Washington Crile

George Washington Crile, one of the founders of the Cleveland Clinic, personified the golden age of surgery. He practiced at a time when physician authority went unchallenged and patients lacked autonomy. Indefatigable and resourceful, Crile worked relentlessly to bring modern technology into the operating room with varying degrees of success.

Young Surgeon

Private Practice

Shock

Crile at War

Surgical Societies

The Cleveland Clinic

Tangled Research

Last Hurrah

## Chapter 18 ..... 247

## The Flexner Report

The Flexner Report exposed the pitiful condition of medical education at the turn of the twentieth century. Often praised for the positive influence it exerted upon American medical schools, the report was neither an objective study nor meant to help weaker institutions improve themselves. The Flexner Report likely accelerated educational reform, yet the method by which the study was conducted made medical schools distrustful of outsiders.

Bulletin Number 4

The Carnegie Foundation

Abraham Flexner

Report Card

Medical Upshot

## Chapter 19 ..... 262

## The Molecular Paradigm

The intellectual revolution created by the cellular theory of disease met little resistance after it was introduced. By contrast, the concept that health (and disease) was a function of chemicals, whose existence inside cells could only be inferred, evolved slowly. The discovery of the biochemical basis of phenylketonuria (PKU) is an example of how this metamorphosis in thinking took place.

Thinking Molecular

The Girl Who Never Grew

Discovery of PKU

One Gene - One Disease

## Chapter 20 ..... 271

## Emergency Room Medicine

For many Americans the emergency room is the only avenue by which they can enter the health care system. Under increasing financial pressure to stay in the black, private emergency departments transfer uninsured sick and injured patients to public hospitals. Occasionally the strategy backfires. Hospitals have learned the hard way that even a Nobel Laureate can look like a homeless person.

Oops!

Legend of the Bronx

Dumping Syndrome  
Roberts v. Galen of Virginia  
Emergency Medicine

Chapter 21 ..... 287

Surgical Innovation

The diseased heart presented nearly insurmountable obstacles for surgical repair. Once surgeons felt comfortable operating in the chest, they created ingenious methods to correct congenitally malformed hearts. Because experimental heart surgery was intimately related to clinical care, it blurred the distinction between surgery and research.

The Last Frontier  
The Blalock-Taussig Shunt  
Inside the Heart  
Alternative Solutions  
Cross-Circulation  
Heart-Lung Machine  
Cost of Progress

Chapter 22 ..... 310

Coronary Artery Disease

By the middle of the twentieth century, coronary heart disease was the number one killer of Americans. Physicians had little understanding of what caused this chronic vascular disorder. During his first term in office, Dwight Eisenhower gave coronary artery disease a personal face. He demonstrated how victims of heart attack could lead productive lives.

Stealth Killer  
Fruits of War  
Presidential Heartburn  
Convalescence  
Recovery  
Surgical Experiments  
Internal Mammary Artery Ligation

## Chapter 23 ..... 330

## Human Research

Perhaps the most unflattering chapter in American medical history deals with human experimentation. Until relatively recently, physicians failed to consider the role patients have in deciding to participate in medical experiments. The field of bioethics emerged in the last half of the twentieth century amidst controversial research and a medical culture resistant to change.

Slippery Slopes

Road to Nuremberg

Medical Trials

The American Scene

Snitch

The Willowbrook School

The Tuskegee Study

## Chapter 24 ..... 354

## Evidence-Based Medicine

Randomized clinical trials helped forge the paradigm of evidence-based medicine, a clinical philosophy that emphasizes scientific evidence over anecdote. Teaching the principles of evidence-based medicine, however, may not be enough to override conflicting cultural, political and economic forces. The American experience with bone marrow transplant for advanced breast cancer is offered as an example of how the delivery of care is shaped by interests beyond that of the patient.

Shifting Paradigms

Randomized Clinical Trials

Testing Medical Hypotheses

Retinopathy of Prematurity

Priorities

Bone Marrow Transplant for Breast Cancer

Trust



Chapter 25 ..... 373

Health Insurance

Medicine has always been a commercial enterprise, but the conflict between its humanitarianism and profit-making imperatives reached a crescendo during the last decades of the twentieth century. The evolution of health insurance provides perspective into the schizophrenic nature of the medical profession.

Conspicuous Dichotomy

Prepaid Medical Care

Hospital Insurance

Committee on Economic Security

Cooperative Medicine

Trustbuster

Morris Fishbein

The Committee of 430

Wagner-Murray-Dingle

Whitaker and Baxter

Medicare Act

End-Stage Renal Disease

Gamesmanship

Chapter 26 ..... 403

Competition—A Tale of Two Departments

Medicare ushered in decades of prosperity for academic medical centers. In the late 1980s the proliferation of specialists made competition tense even for university medical centers. Two eye departments had different approaches to keeping their market share. One built a modern free-standing eye institute that soon went bankrupt and the other got caught “gaming” Medicare. Neither tactic was successful, but these examples beg the question as to how often do these ploys go unnoticed or unreported?

Why is everyone Miserable?

Eye Institute Envy

The USF Eye Institute

Things Never Taught in Medical School

Conflict and Complexity

Notes.....	414
Bibliography.....	437
Acknowledgments.....	470
Index.....	471

## PREFACE

One means by which physicians learn to cope is by invoking imperatives and viewing their environment in black and white. Dichotomous choices in medicine are the rule, not the exception. Laboratory tests are either normal or abnormal; biopsies are either benign or malignant; clinical judgments are either right or wrong (in foresight or in hindsight). Shades of gray seldom exist (or, at least, rarely admitted to), perhaps because they could be seen as a sign of weakness or indecision. This same absolutism has been applied to the interpretation of American medicine. It is considered either stellar or abysmal, when, ironically, it may be both.

For decades I have valued and cursed medicine, finding myself a tormented observer of the profession. Praise for the practice of medicine is understandable because so much beneficence comes from it. I know physicians who embody every aspect of professionalism. Their proficiencies span the dimensions of competence. Doctors are knowledgeable, inquisitive, and capable of commandeering strength in times of stress. They manage uncertainty daily, knowing it is the enemy of self-confidence. I have been surrounded by men and women who are intuitive, empathetic, and caring. They are wizards of sorts, keeping technology at bay and not letting it consume them, something easy to fall victim to in what is now a technology-driven profession.

At the same time, I have worked with physicians who lack curiosity, attentiveness, self-discipline, and emotional intelligence. Others in my profession cannot resist the temptation to financially milk the system, a practice euphemistically called *gaming*. As surprising as this range of behavior is, these individuals are able to work with one another in apparent harmony—most of the time. It is no secret that doctors are poor police officers, silently tolerating the unscrupulous and incompetent in their ranks.

The practice of medicine is filled with contradictions and inexplicable observations. One of my favorites is the issue of quality and how it is measured. I suspect most physicians in practice today believe American medicine is the finest health care system in the world, with an opinionated minority disagreeing. I discovered years ago that divergent opinion is nothing unique in the learned professions. When I first explored the phenomenology of medical disputes, its historical roots trace back to the time doctors first set foot on this continent. The archaic quality of these

controversies captivates the imagination. The political nature of humans, it seems, makes us prone to polar judgments regardless of occupation. Although physicians are not the only professionals to fall victim to the perils of dichotomous thinking, the implications for patients are far-reaching.

I am not alone in finding inconsistency and contradiction in our system of health care. Arnold Relman, former editor-in-chief of the *New England Journal of Medicine*, begins his 2007 book, *A Second Opinion*, with a quote from President George W. Bush: “America has the best health care system in the world, pure and simple.”<sup>1</sup> Then juxtaposed to the President’s remark are the words of Donald Kennedy, former president of Stanford University and editor-in-chief of *Science*: “The U.S. health care system becomes a more embarrassing disaster each year. . . .”<sup>2</sup> Could anything be more intellectually rewarding than to reconcile these interpretations and understand how such ostensibly mutually exclusive views could come about?

Nowhere in my formal education or training has medical history been assigned any degree of importance. There is an oral tradition to medicine and surgery that resembles mythology more than historiography. It serves a role in indoctrinating young doctors into the profession and, like many legend-based histories, has serious downsides. It can perpetuate a professional superiority complex that works against the tenets of humanism, which ultimately distances physicians from their emotional intelligence.

The first books I read on medical history described in varying detail the events surrounding famous medical discoveries and innovations. They were hardly balanced accounts, typically ignoring the failures that preceded success. Some were tedious recollections of names and dates, portraying physicians in sharp relief without ambiguity. Rarely was medicine explored in any cultural context, either the broader American culture or its own professional microcosm. What I read was much like the American history I was taught in high school—sanitized. This is not to say that critical works did not exist. They did, but were few and often highly focused critiques.

For hundreds of years, doctors in North America could not be distinguished from medical imposters because the art of healing could be easily and effectively imitated. What made doctoring so easy to mimic was that physicians were unable to cure disease or alleviate pain or suffering. Essentially anyone could prescribe placebos. The scientific basis of medicine was painfully slow to take root, but it did eventually catch on thanks to the extraordinary groundwork completed in Europe. Without contributions from the Old World, there is no telling how long humanity would have had to wait for a rational system by which to classify and treat

disease. Once a rudimentary knowledge of biology was incorporated into medical practice, the profession gained economic and political strength, leaving in its wake the corpses of empirics, homeopaths, and charlatans.

The phenomenal growth of medicine in the second half of the twentieth century was made possible by a dedication to high educational standards while embracing science and technology. Physicians were soon amply rewarded for their special knowledge and skills. Then other tribulations developed. The profession appeared to lack leadership commensurate with its vaulted position in society. The medical profession for much of its modern existence lacked identity. The disparity between power and purpose was due to the dual forces that shaped American medicine: humanism and commercialism. Doctors may have achieved unprecedented authority in society, but it was squandered by the inability to agree upon a primary mission. Fragmented and decentralized, the medical profession over the last half-century has grown into a commercial powerbroker, providing the most costly and inefficient health care in the world. How did such a thing happen?

*An Informal History of American Medicine* was written to unravel and celebrate the convoluted history of the medical profession. It attempts to recount the scientific and technological achievements of medicine in context with the values, beliefs, and behavior of the medical profession itself. Because American medicine is such a vast subject, selecting what to cover is crucial to telling the story. Determining content is as precarious a task as it is a potentially creative a tool. Failure and misadventure seldom get included in historical surveys of science and medicine, despite their critical role in shaping events. Works that examine medical misadventure risk being thought of as “exploitive”—trashy exposés of dubious merit. But ignoring the darker side of medical history is as misleading as it is dull. Consider too that heroes take on even greater stature when measured against the scoundrels that surround them.

Meaningful trends in science and medicine also take time and distance to fully comprehend. It is not easy to portray past events in a fair and unbiased manner given the advantage of historical perspective. Daniel Boorstin deserves credit for warning historians to avoid being “seduced” by the false sense of wisdom that hindsight confers.<sup>3</sup>

Medical jargon is arcane. Its complexity is explicable as it helps justify the elite status of the profession. But esoteric language also interferes with effective communication. Language has frustrated the study of medical history since the time of Thucydides.<sup>4</sup> Concepts exist through words and sentences; when concepts are unfounded it creates havoc with language. Until the last 150 years, concepts of disease were unsound or untenable.

Consequently, the words used to convey the mechanism of disease were hollow; they had little meaning. The obtuse medical nomenclature of the pre-biology era was not just tedious to read but verged on gibberish. I have limited the use of antiquated terms in this book, hopefully without implying that any greater understanding of disease existed in the past than really did.

Physicians, with their special position in society, routinely collect intimate information on the lives of their patients. Doctors are by the nature of their work biographers. Ever since I learned about the curious medical care surrounding the deaths of historical figures like George Washington and Franklin Delano Roosevelt, I have appreciated the educational value of medical biography. For this reason, I have included in many chapters noteworthy encounters that famous Americans have had with the medical profession. They tend to be sobering events that shed light upon the interaction of medicine and society.

*An Informal History of American Medicine* is a compilation of stories about the people, institutions, and events that moved American medicine forward and backward over the last few centuries. Many of these narratives grew out of the oral history I learned during my years of training. I have included background on the technical aspects of medicine and surgery to make the march of events as comprehensible as possible without over simplification. Because American medicine does not exist in isolation, several chapters are devoted to describing its relationship to European medicine and to science in general.

This work was sewn together from secondary sources. I have tried to accurately credit the sources relied upon to construct narratives. Any failure in this regard is my responsibility. In tribute to George Santayana's warning that "those who cannot remember the past are condemned to repeat it," people who do read history are condemned to interpret it. *An Informal History of American Medicine* is an invitation to reflect on the meaning of medicine in our society.

## FOREWORD TO SECOND EDITION

How should second editions be characterized? The second edition of *An Informal History of American Medicine* is both modified and expanded. Each of the original 25 chapters has been revisited. Portions of narratives that were obtruse or vague have been clarified to the best of my ability. Over the past 13 years, colleagues and friends have suggested topics to include in future generations of the book. I have considered these recommendations carefully and found the proposals interesting as they provide perspective on what people desire to know about the practice of medicine not easily found in textbooks. A new chapter “Competition – a Tale of Two Departments,” has been added. The chapter deals with the single most common question I get asked about practicing medicine in a competitive environment. It provides what may be a unique view of how academic departments cope with adversity.

**Curtis Margo, Tampa, Florida  
November 6, 2022**





# CHAPTER 1

## THE COLONIAL LANDSCAPE

### Indigenous People

Thousands of years before European settlers reached North America, an indigenous people, whose forbearers were said to have migrated over the Bering landmass, inhabited the continent. The hundreds of Indian nations scattered across its lands had little in common beyond how different their cultures were from that of Europeans. Physically dissimilar from the Mongoloid people to whom they were supposedly related, most Native Americans lived within nomadic communities or small permanent settlements. Soon after Columbus made his first journey to the Western hemisphere—and many generations before the inevitable conflict between White and Indian cultures signaled the destruction of Indian civilization—a pestilence descended on North America.<sup>1</sup> Its agents are now known to be many, but for the first inhabitants of North America this deadly and pernicious attack was a singular evil.

On Columbus's second visit to the island of Hispaniola, he brought livestock he did not know was infected with influenza. Perhaps one of the oldest of human diseases, influenza is initially acquired from pigs or waterfowl and spread by humans through the secretions of the respiratory tract. In small populations the virus runs a limited course, either by inducing protective immunity after an abbreviated illness or by killing its host before it can infect others. But in Hispaniola there had been no contact with this or similar forms of contagious disease before the Spanish arrived. The virus spread through the virgin population of the island before laying waste to the Caribbean basin with amazing speed.<sup>2</sup> Traders eventually carried it to Florida, where—like a harbinger of more deadly things to come—the virus flourished in other highly susceptible populations.

Influenza was just the first of many lethal infections brought to the New World by Europeans. During the first and second decades of the sixteenth century, two waves of smallpox swept across the Caribbean islands before the virus emerged on the continent near the Yucatan Peninsula. This plague caused death and destruction in the Indian

communities on an unprecedented scale. Native Americans were terrified by the mysterious fever that disfigured the face and body with thousands of boils before suffocating its victims from within. With no protective immunity, Indians of all ages were defenseless against the disease. Individuals in large families and close tribal communities would often develop symptoms of infection simultaneously, leaving no one well enough to care for the sick, or to provide food or water for those recovering. It was not unusual for an entire tribe to perish from smallpox, a tragic measure of how immunologically susceptible the population was to common European pathogens. Some disagreement persists over how the first case of smallpox entered the New World.<sup>3</sup> The most likely source was a crew of sailors with foul-smelling pustules that entered the port of Veracruz aboard the ship *Panfilo de Narvaez* in 1520. Within a year, smallpox had spread throughout present-day Mexico and Central and South America. The number of lives lost from early pandemics has been estimated in the millions, although reconstruction of these remote events involves considerable guesswork.<sup>4</sup>

As Spanish explorers and their domestic animals made their way into the interior of the continent, they shared an assortment of pathogens with each new population of Native Americans they encountered. The general direction of spread was north from Central America through present-day Mexico. Only the scarcity of population centers and rarity of travel slowed the pestilence. Once Europeans began to inhabit the east coast of North America in sufficient numbers, Native Americans found themselves assaulted by mysterious diseases on two fronts. By the middle of the sixteenth century, tens of thousands of Mesoamericans had been killed by pneumonic and bubonic plagues, typhus, typhoid fever, measles, and venereal disease. Recurrent pandemics of smallpox and influenza would continue to decimate Indian nations across the entire continent for decades to come.

During the first half of the eighteenth century, five smallpox epidemics were reported in New Mexico. Half the Catawbas of South Carolina died during the smallpox outbreak of 1759. The same proportion of Cherokees perished when the tribe first encountered the virus in 1740. They barely escaped annihilation a generation later when immunity fell below protective levels. Primitive communities such as these were unprepared for the consequences of large-scale epidemics. The infrastructure of Native American villages buckled under the pressure to maintain social order, while some disappeared forever. When left without young men to hunt or elders to lead, smaller communities risked extinction. Neighboring tribes might accept survivors, but outsiders were never enfranchised and commonly risked enslavement.

The practice of medicine varied considerably among different tribes. Most medical men learned to treat fractures and dislocated joints through experience, finding mechanical stabilization a time-tested method that allowed bones and ligaments to heal. Common sense would likewise guide the treatment of flesh wounds and other injuries. But tribal doctors believed illness was the result of supernatural forces and, therefore, relied almost exclusively upon a spiritual approach to treat disease. Try as they might, shamans could not rid bodies of the demons that caused rheumatism or stroke. Herbal medicines were used in many tribes, but no plant extract at the time could alter the course of contagious disease, cancer, or heart disease. Indian magic was ineffective in combating the pestilence brought by White men, but shamans were spiritual leaders who served other important functions in their communities. Tribal doctors were father figures, men of character, who held villages together through trust and leadership.

It is estimated that in the hundred years prior to 1619 as many as 90 to 95 percent of the Native American population succumbed to infectious disease.<sup>5</sup> With a population between five and ten million in 1492, the Indian communities of North America found themselves struggling for survival at the time European settlers began arriving in large numbers along the east coast.<sup>6</sup> With many tribes depleted of warriors, Indians were in no position to thwart White occupation.<sup>7</sup> Several years before the Pilgrims arrived in New England, local tribes had been severely affected by smallpox brought by early European explorers. The outbreaks stressed the social network of several Indian communities along the coast, reducing their options in how to deal with the new arrivals at Plymouth. The ranks of younger males had been depleted to the point that tribes did not have the capacity to defend their land from the intrusion of White settlers even if they wanted to. In an era preoccupied with religious delusion, the Pilgrims likely construed the outbreak of smallpox that heralded their arrival as an act of divine providence.

It took time for the American Indian to associate the great pestilence with Europeans because the agents of disease were invisible and transmitted by a variety of vectors (e.g., air, animals, water, etc.). Native Americans, after visiting port cities or trading posts, carried germs with them to the hinterlands, where they spawned derivative epidemics. Perplexed at first by how these pale-skinned strangers could inflict fever and death from great distances, they eventually understood the connection between White men and disease. Once tribes accepted that Whites had the power to cause grave illness, they attributed it to witchcraft or sorcery. Such malicious and deadly curses must have been seen as acts of incomparable evil.

Historians have paid scant attention to the destruction caused by contagious disease in Native Americans during the post-Columbian era, preferring to concentrate upon the later struggle brought about by cultural differences between Indians and European settlers. From their earliest encounters with indigenous tribes, Whites demonstrated little respect for Indian values or traditions. The reluctance of the American Indian to adopt Christianity or to accept the European concept of property ownership only aggravated the cultural divide. Since Europeans regarded Indian society as backward and Indians themselves as savages, it made mutually solicitous interaction nearly impossible. Although cultural differences would persist and eventually lead to the near extermination of the indigenous people of North America, contagious disease continued to play an important role in the ongoing battle over land and personal freedom. Because the Indian populations had already sustained an insurmountable setback from contagious diseases by the time the British colonists arrived, Native Americans lost any advantage that numerical superiority might have offered.

As time passed, survivors developed immunity to common pathogens. Eventually, Native Americans would acquire the same resistance to infectious diseases as Whites, but by then the damage to Indian culture had been done. Indian societies, without steel and machinery, proved to be no match for the new Americans who wanted land for farming and hunting. Within two hundred years, the remaining Natives would be confined to small reservations on land that Whites did not wish to own. White Americans disregarded their common humanity with Native Americans while microbial pathogens were not nearly as intolerant, showing little discrimination among humans of any race.

## **Medical Organization**

Far from monarchical oversight, Europeans found North America bountiful but harsh—both physically and psychologically. The trappings of old age were not easily attained in British colonial America unless an individual exercised a modicum of cautious behavior and learned to keep a safe distance from strangers. It also helped to possess good fortune and parents who had outlived their contemporaries.

Colonists along the eastern seaboard saw their high rates of birth offset by high rates of infant and childhood mortality. Death from puerperal fever or excessive blood loss during childbirth exacted a toll upon families and depleted communities of women in their reproductive years. Widowed fathers, often forced to give away children they could not raise, were a forgotten casualty in this cycle of harshness. The inhabitants of the New

World had to plan their lives according to grim realities: They were defenseless against infectious disease and forced to anticipate being periodically ravaged by epidemics of smallpox, malaria, yellow fever, and influenza. If these diseases were not enough to dampen colonial spirits and thin the ranks of senior citizenship, much of the population was nestled in the wilderness where settlers had to cope with Native Americans and the violence spurred over property and possession. Wounds acquired in battle or from farming accidents—often small and seemingly innocuous—frequently became infected, resulting in blood poisoning and death. Random attacks of malignant fever, acute bellyaches or pleurisy could leave a child orphaned, or a husband or wife widowed at any time. Such events were constant reminders of the capricious nature of health.

Any feelings of helplessness that the colonists may have had were compounded by the patchwork of healers referred to as “doctors.” With the colonies isolated from European centers of learning, medical school was an indulgence few young men could afford. Because of the shortage of formally trained physicians, other types of healers filled the void.<sup>8</sup> With social consent, the appellation “doctor” was given to healers regardless of their education, credentials, or training. They came from a variety of backgrounds and worked independently of one another. Those with some form of training, no matter how trivial, tended to recognize a loose hierarchical order among fellow healers. This tacit distinction was by no means universal. As the divisions between healers widened and the distinction between groups blurred, economic tensions increased as they vied for patients. Because there was no common ideology that united healers into one professional community, their relationships were guarded and distrustful.

The heir apparent to professional “doctoring” (other than the few European medical school graduates who came to live in North America) was the apprenticed-trained physician. These men were often illiterate. They usually learned their trade locally from other apprenticed-trained doctors. Receiving little or no formal education and having few if any textbooks to study, the apprentice learned by observing. With training dependent upon the skills and knowledge of a single mentor, the quality of education could vary greatly. Although apprenticeships could last up to seven years, apprentices had, in fact, limited exposure to anything resembling a well-rounded clinical practice. The experiences of most students were confined to the opinions of just one doctor, who was more likely to treat his apprentice as a common laborer than a future colleague. Though understandable for a frontier society, the apprenticeship system

created medical provincialism while inhibiting the advancement of liberal education and scientific learning.

The typical apprentice was an indentured servant who willfully entered into a contract because he thought the obligation not excessively long and the potential rewards sufficiently tangible. For several years, most apprentices performed menial tasks, including running errands, cleaning equipment, washing bottles, and sweeping floors. If performance was satisfactory, they would be taught to mix drugs, apply plaster casts, hold a bleeding cup, and identify herbal remedy plants. It would be towards the end of servitude that many apprentices were allowed to participate in the pulling of teeth, delivering of babies, and lancing of boils. Preceptors who worried about local competition may have found it to their advantage to teach apprentices as little as possible, knowing a few botched procedures in private practice could force a recent graduate to move elsewhere.<sup>9</sup>

The apprenticed-trained physician, having gone through years of menial labor, may have believed he was the legitimate beneficiary of medical authority. This opinion, however, was not that of colonial society. The title “doctor” could be worn by anyone who wished to assume the role. In an environment that placed no restriction upon who could practice medicine, the apothecary, old-world barber, or midwife could serve as community doctor without fear of public rejection or legal rebuke. Having been freed from the yoke of old-world tradition, colonists wanted no tests of competence, university degrees, or certifications of training as prerequisites to practice medicine. The absence of professional guilds and the lack of governmental regulation made the practice of medicine a free-wheeling endeavor with medical assistants, druggists, and bonesetters joining the ranks of physicians willy-nilly.

Women, as the head of households, made up most of the ubiquitous medical workforce, practicing what was loosely referred to as “folk medicine.” Mothers and wives spent considerable time preparing for and dealing with the multitude of maladies that afflicted the colonial family. Often known as “domestic healers,” they were, by default, the only medical resource available for many families. Their formal training was nonexistent and therapeutic arsenal paltry. It consisted principally of herbal or kitchen remedies designed to treat everything from gastrointestinal hemorrhage to consumption. More than a nurse, the domestic healer dealt with injury and disease that would challenge a modern-day surgeon or infectious disease specialist. Pragmatic and self-reliant, domestic healers were available for family and friends, yet were not directly involved in the commercial enterprise of medicine. Since they seldom sold their services, the domestic