

The Secularization of Pain

Donald Caton, M.D.*

After Morton's demonstration in the Ether Dome of the Massachusetts General Hospital, anesthesia for surgery was accepted around the world at a speed unusually fast for any medical or scientific innovation. However, the concept of surgical anesthesia had been rejected on four occasions during the preceding 40 years. The rapid acceptance of anesthesia in 1846 appears to have had a political and social basis as well as medical. Two factors are particularly important. First was a change in the perception of disease and pain; both lost religious connotations and became biologic phenomena as part of a process of secularization that affected all aspects of Western society. Second was the growth of a sense of well-being and progress, which imbued patients and physicians alike with confidence in their ability to control natural processes. During the last half century, pain has remained secular, but the confidence in both progress and the ability to control nature may have diminished. (Key words: Anesthesia: history. History: Morton; Snow; Long. Pain.)

IN SCIENCE AND MEDICINE, we date a discovery from the publication of an important article, the first public demonstration of an experiment or a phenomenon, or the delivery of a lecture. Properly done, such a presentation is a paradigm, in the sense used by Thomas S. Kuhn.¹ It crystallizes thought, starts work in a productive new direction, and is a model for future experiments.

So it was with anesthesia. Our specialty began with Morton's dramatic demonstration of the anesthetic properties of ether in October 1846. News of Morton's work spread fast. The first anesthesia in London was administered within 2 days of the docking of the Cunard Company's paddle steamboat, Acadia, which carried Bigelow's letter describing the event.² Within a month, anesthesia had been used in most major European cities and, within 5 months, even in China.^{3,4} Bigelow said, "No single announcement ever created so great and general excitement in so short a time. Surgeons, sufferers, scientific men, everybody, united in simultaneous demonstration of heartfelt mutual congratulation."⁵ There was hardly time to repeat Morton's work, much less to test or discuss it critically before it was accepted by others.

As often happens with paradigms, Morton's demonstration was preceded by the work of many others. Ancients had methods to control pain that were somewhat successful.⁶ By 1824, Sir Humphrey Davy had recognized the anesthetic properties of nitrous oxide; his student, Michael Faraday, had commented on the soporific effects of ether, and Henry Hill Hickman had suggested using carbon dioxide as an anesthetic.⁷ By 1844, Crawford Long had performed surgery on a patient successfully anesthetized with ether (though he failed to publicize this accomplishment); Wells had tried, but failed, to do the same with nitrous oxide, and countless others had used the drugs for frolics.⁶ Despite this, no one had established the idea that drugs could and should be given to render patients free of pain during surgery. In fact, each of these men encountered some form of rejection of their idea: Davy from an uninterested patron,⁸ Faraday and Hickman from the scientific community,⁶ Wells from skeptical surgeons,⁶ and Long from suspicious and reluctant patients.^{9,10}

Why did Morton succeed where others had failed? What caused people to embrace the idea of surgical anesthesia a few scant years after they had ignored or rejected it? Part of the answer may lie in the character of the times. From the turmoil of the Renaissance and the Enlightenment developed a spirit of optimism and a new perception of disease. This development reached fruition during the early 19th century, when pain and suffering were "secularized"; they lost their religious connotations and became biologic phenomena that could be "managed."

The Background

From the fifth century, A.D., until the Enlightenment, the Christian church dominated most of Western culture. Monasteries were repositories of books and learning; clergy organized hospitals and distributed benevolences; and civil and canon law were coterminous. Priests officiated at every major event in people's lives—baptism, confirmation, communion, marriage, sickness, and death. The church also had a long tradition of dealing with pestilence and death, suffering, and pain.

Early people could do little to control disease and suffering, but the church gave comfort. As C. S. Lewis observed, "All great religions were first preached, and long practiced, in a world without chloroform."¹¹ To

* Professor of Anesthesiology and Obstetrics and Gynecology.

Received from the Departments of Anesthesiology and Obstetrics and Gynecology, University of Florida College of Medicine, Gainesville, Florida. Accepted for publication November 2, 1984.

Address reprint requests to Dr. Caton: Department of Anesthesiology, Box J-254, J. Hillis Miller Health Center, Gainesville, Florida 32610.

the Greeks and Jews, from whom the Christians inherited many ideas, disease and pain were punishment, inflicted for breaking divine law. The book of Job states, "They that plow iniquity, and sow wickedness, reap the same/ By the blast of God they perish and by the breath of his nostrils are they consumed" (4:7-9), "The wicked man travaileth with pain all his days" (5:17), and "He is chastened also with pain upon his bed and the multitude of his bones with strong pain so that his life abhorreth bread and his soul dainty meat" (33:19-20). Similar passages are in Isaiah (3:10-11), Genesis (38:7), and Psalms (92:6-8). Groups that sinned, such as inhabitants of Sodom and Gomorrah, also were punished, either with pestilence or total destruction. In contrast, "No ills befall the righteous" (Proverbs 12:21). The story of Job seems inconsistent with this because Job is a righteous man. But it makes the point, since Job's "comforters" interpreted his misfortune as *de facto* evidence that he had sinned.

But disease and pain had other connotations: the disease that punished also cleansed. This too was a gift from God. "Behold, happy is the man, whom God correcteth: therefore despise not the chastening of the Almighty/For he maketh sore and bindeth up: he woundeth, and his hands make whole" (Job 5:17-18). Similarly Christ's ordeal on the cross offered people the possibility of redemption, the expiation for Original Sin, which had "brought death into the World, and all our woe."¹² According to the New Testament, healing was also a gift from God (1 Corinthians 12:9, 12:28, James 5:13-16). The emphasis in the Old Testament on the spiritual condition of the sick was continued in Christian liturgies for the ill and dying.¹³

This concern for the ill brought personal hygiene, along side ethics, morals, and theology, into the purview of rabbis and priests. In fact, priests and ministers considered themselves no less trained in, nor any less capable of, interpreting "natural laws" than physicians.¹⁴ This attitude persisted in northern Europe and was carried to colonial America, where physicians usually were members of the clergy.¹⁵ Some achieved renown for their medical or scientific work. Both Joseph Priestley, who discovered oxygen, and Stephen Hales, the first man to measure blood pressure, were ministers. Cotton Mather, a puritan theologian, helped to introduce vaccination for smallpox into the colonies¹⁶; John Wesley, founder of Methodism, wrote a popular book entitled, *Primitive Remedies*¹⁷; and, in 1766, the first president of the Medical Society of New Jersey was a physician-clergyman, as were six of its 36 members, a proportion that decreased in subsequent years.¹⁸

In addition to its religious significance, pain also was used as magic. For example, the bubonic plague, which capriciously decimated the population of Europe, was

seen as a manifestation of "God's just anger with our wicked deeds sent . . . as a punishment to mortal men . . . [which] no doctors advice, no medicine could overcome or alleviate."¹⁹ This was a thought expressed by many.²⁰ To induce God to spare them future, possibly worse, torment, groups wandered from town to town and practiced flagellation.^{15,21,22} By common definition this is magic: the use of an act (in this case, self-inflicted pain) or incantation to induce some desired effect.²³

Pain figured prominently in other aspects of life as well, possibly as a corollary of its religious significance. Huizinga describes the Late Middle Ages as a time of great cruelty,²⁴ which he attributes in part to callousness developed in those who survived the ravages of the Black Death. This cruelty was evident in judicial torture to extract information and confessions; in public executions, which were brutal and staged as much for public amusement as for justice; and in popular sports such as bull- and bear-baiting and dog and cock fights. Even the church used torture to extract confessions from witches and heretics; fire and pain were alleged to serve double duty as means of execution: they rid the world of evil influence and helped to purify the condemned as they sped to meet their Maker. The notion illustrates again pain's dual role in punishment and redemption.

Some knew that suffering also came from natural phenomenon, which they could combat—hence the development of folk remedies.¹³ During the plague, even as they prayed for relief, people practiced techniques of public health, including isolating those who had been exposed.²⁵ Nevertheless, sacred interpretations of disease and pain predominated over the secular. John Wesley said, "As he knew no sin, so he knew no pain, no sickness, weakness or bodily disorder . . . The entire creation was at peace with man, so long as man was at peace with his Creator."¹⁷ Similarly, Cotton Mather wrote, "Our Sickness is in short, *Flagellum Dei pro Peccatis Mundi*. Now, Sickness is to awaken our Concern, first, for the Pardon of the Maladies in our Souls," and "Lord, look upon my Affliction and my Pain, and forgive all my Sin."¹⁶ Therefore, clerics saw healing as a way to save the soul and medicine as gifts from God, though the Maker did not always send them in a usable form.

But the prevailing attitude of parishioners was resignation. Consider these lines by John Donne²⁶:

There is no health; physicians say that we
At best, enjoy but a neutrality.
And can there be worse sickness, than to know
That we are never well, nor can be so?
We are born ruinous: poor mothers cry,
That children come not right, nor orderly,
Except they headlong come, and fall upon
An ominous precipitation.

Donne (1573–1631) is noteworthy for two reasons. First, he was well read in medicine, besides being a minister and poet.²⁷ Second, his life spanned a transition. After 1600, there was a significant change in the mood in Europe. It moved from the Age of Faith to the Age of Reason. People lost their pessimism and passivity and sought to control the environment. As Owen Chadwick said, during this time society was willing to “jettison notions which hitherto were conceived as necessary to its very existence.”²⁸ With this, the attitude toward disease and pain began to change.

The Transition

In 1901 William James wrote that

a strange moral transformation has within the past century swept over our Western world. We no longer think that we are called on to face physical pain with equanimity . . . The way in which our ancestors looked upon pain as an eternal ingredient of the world's order, and both caused and suffered it as a matter-of-course portion of their day's work, fills us with amazement.²⁹

The predisposition to this change began during the Renaissance, when people reexamined the classical foundations of Christian culture, and flowered after the Reformation. First, people shifted from a dependence on historic revelation for insight and knowledge to observation and experiment. Second, they increased their awareness of natural order and considered it a manifestation of God's laws. Therefore, study of natural laws was a form of religious worship, particularly since this required reason, another God-given gift. This attitude is epitomized in the minister–scientist, Stephen Hales, who, in the preface of his book, *Haemastaticks*, wrote

There is so just a Symmetry of Parts, such innumerable Beauties and Harmony in the uniform Frame and Texture and of so vast a Variety of solid and fluid Parts, as must ever afford Room for further Discoveries to the diligent Enquirer; and thereby yield fresh instances to illustrate the Wisdom of the divine Architect, the Traces of which are so plain to be seen in every Thing.³⁰

Bacon and Descartes promulgated the new method; Galileo, Boyle, Newton, and Harvey used it.

An explicit goal of the Enlightenment was mastery over nature, “to multiply the conveniences or pleasures of life,” or, as Descartes said, to “improve health, lengthen life, and banish the terrors of old age.”³¹ Success engendered confidence and a sense of progress, a “colossal recovery of nerve,” which had been suppressed in western Europe since before the Dark Ages.³² Bacon's statement, “Man is the architect of his fortune,”³³ typified the new attitude and illustrates the movement away from the pessimism expressed by Donne. In time, the movement lost its religious overtones; factories were built for economic gain, art was cultivated for pleasure,

and science was studied for its own sake, not simply for the glorification of God.³⁴ By the end of the 18th century, Hume, Voltaire, and other leaders of the Enlightenment spoke disparagingly of religious ideals. Western culture was becoming secularized.^{28,31}

With secularization came a change in the concept of God's relationship to disease and suffering. The stern sometimes punitive God of Calvinism gave way to the detached but sympathetic and forgiving God of the Enlightenment. William Blake (1757–1827) could write³⁵:

Think not, thou canst sigh a sigh,
And thy maker is not by.
Think not, thou canst weep a tear,
And thy maker is not near.

O! he gives to us his joy,
That our grief he may destroy
Till our grief is fled and gone
He doth sit by us and moan.

Blake's description of infancy is starkly different from Donne's. Blake's infant is “fearless, lustful, happy! nestling for delight/In laps of pleasure; Innocence! honest, open, seeking/The vigorous joys of morning light.”³⁶ People are not born evil, tainted by Original Sin, but innocent, or as Wordsworth (1770–1850) has it, “But trailing clouds of glory do we come/From God, who is our home.”³⁷ What corrupts and destroys a person's innate purity are the imperfections to which he is exposed after birth. Contrary to earlier philosophy, disease, poverty, pain, and suffering predispose men to sin, not the reverse.³⁸ Further, as disease and pain are natural phenomena, they can be studied and manipulated; these ideas would spur the social reform movement of the next century.

According to Gay,³¹ there was an intellectual bond between philosophers of the New Reason and physicians. Philosophers saw medicine as a tool to lift humans from ignorance and squalor. Physicians, in turn, adopting the methods of scholars, reexamined Greek and Arabic texts and abandoned theories of disease in favor of scientific observation and precise measurement. Descriptions by Boerhaave (1668–1738) and Sydenham (1624–1689) remain classics to this day. At first, the study of disease may have been an exercise in the glorification of God,³⁹ but it later existed for its own sake. Still, like other developments during the Enlightenment, medical progress remained illusory; perspective changed, but practice did not. The humoral theory of disease prevailed, and opium and mercury were the only therapeutic agents of worth. The control that Bacon sought remained elusive; Thomas a Kempis's quip, “Man proposes, but God disposes,” still was apropos.

Theory became practice during the Age of Revolution, the period of explosive change between 1776 and 1850.⁴⁰

During this brief span there occurred four major political upheavals (the American, French, and German Revolutions and the Napoleonic Wars), an industrial revolution and agrarian reform, and major new developments in physics, geology (Lyell), biology (the cell theory of Schleiden and Schwann), and chemistry (Lavoisier, Priestley, and Scheele). Within 20 years after the invention of the steam locomotive in 1827, almost 7,000 miles of track were laid in Great Britain alone. In the United States the area of the country doubled with the Louisiana Purchase (1803) and, spurred in part by the discovery of gold at Sutter's Mill (1848), the great Western migration started. Victoria's coronation in 1837 ushered in a period of prosperity and expansion of the British Empire. In America, Andrew Jackson's inauguration as President marked the beginning of populism, a movement that had repercussions for science and medicine.⁴¹ Western Europe and America were suffused with an extraordinary burst of energy and sense of progress.³² Modern medicine was born during this revolution and so was anesthesia.

The 19th Century

SOCIAL CHANGE

Medicine and anesthesia developed during the early 19th century as part of the humanitarian movement,⁴² so named for the high value placed on the temporal welfare of people. It would be naive to oversimplify the motivation for a movement so diverse that it included labor laws, women's suffrage, child protection laws, welfare programs for the poor, reform of prisons and schools, the antivivisection movement, and the abolition of slavery. But common to these social programs, as noted by William James, was a preoccupation with pain. Public inquiries into atrocious working conditions and physical abuse of women and children in mines and factories led to labor laws⁴³⁻⁴⁵; exposés of experiments on unanesthetized animals, even by prominent physiologists, fueled the antivivisection movement,⁴⁶⁻⁴⁹ just as graphic descriptions of "blood" sports won support for newly formed societies for the protection of animals⁴⁹; publicity surrounding the death of a soldier punished by flogging led to reform of military discipline in England²; and hazing and brutal discipline prompted Thomas Arnold's reform of British public schools.^{44,45}

The church helped promote these humanitarian movements. But change also occurred within the church itself. According to Vidler it was the apparent immorality and inhumanity of the Christian scheme of salvation that prompted this revolt.⁵⁰ This is reflected in a comment by Joseph Priestley, who had been raised as a strict Calvinist but later became a Unitarian. Speaking

of his examination for ordination in the Methodist Church, he said, "When they interrogated me upon the sin of Adam, I appeared to be not quite orthodox, not thinking that all the human race were liable to the wrath of God and the pains of hell forever on account of that sin only."⁸

Evolution in the perception of pain is evident in the work of three consecutive English political philosophers, John Locke (1632-1704), Jeremy Bentham (1748-1832), and John Stuart Mill (1806-1873). All three consider pain and pleasure prime factors in human motivation and, to different degrees, build their philosophies around this point.

Some time between Locke and Mill, pain changes from a divine to a natural phenomenon and from a beneficial to a destructive process. For example, Locke, in the optimistic fashion of the Enlightenment, believes that pain and pleasure are God given and "designed for the preservation of our being."⁵¹ Although acknowledging that God may inflict both pain and pleasure, Bentham believes this happens in accord with "natural laws"; even though God may initiate punishment, it is administered through natural processes. Bentham, in contrast to Locke, sees no good in pain and calls it "inherently evil."⁵² Mill, the last of the three, epitomizes the secularization of the attitude towards pain; he accepts no connection between God and pain and attributes it solely to harsh and capricious natural processes. He says,

Nature impales men, breaks them as if on the wheel, casts them to be devoured by wild beasts, burns them to death, crushes them with stones like the first christian martyr, starves them with hunger, freezes them with cold . . . with the most supercilious disregard both of mercy and justice . . . upon the best and noblest indifferently with the meanest and worst . . . Even when she does not intend to kill she inflicts the same tortures in apparent wantonness . . . No human being ever comes into the world but another human being is literally stretched on the rack for hours or days, not unfrequently issuing in death.⁵³

The pain of Bentham and Mill is devoid of nuances of punishment, redemption, and magic that had moved men since before Christ.⁵⁴

Throughout the work of Locke, Bentham, and Mill, pain retains a connotation of utility, but there is evidence of evolution. Through the Middle Ages pain was a means of spiritual purification. In contrast, pain had no such ethereal meaning to Locke, who considered it simply an adjunct to learning. "Attention and repetition help much to the fixing any ideas in the memory. But those which . . . make the deepest and most lasting impressions, are those which are accompanied with pleasure and pain." Though Bentham and Mill call pain evil, they also consider it necessary to enforce social harmony. But punishment administered only for retribution is morally indefensible. "Pleasure and its securities is the end, and the sole end the legislator ought to

have."⁵² Mill is even more outspoken when he says the "hurtful agencies of nature" promote good only by "inciting rational creatures to rise up and struggle against them."⁵³ Mill's statement reflects the activism of the period and illustrates the shift from sacred to profane, from future to present, from spiritual to material.

During this time the definition of pain, and of pleasure, became more explicit. Locke draws no distinction between sensation that is physical and that which is mental, including "whatsoever delights or molests us; whether it arises from the thoughts of our minds, or anything operating on bodies." In this, Locke conforms with the perception prevalent since biblical times, an especially interesting point because he trained in medicine, though he never practiced. Bentham, on the other hand, in a detailed analysis of pain, clearly distinguishes between physical suffering and mental anguish. He classifies various causes of pain—natural, manmade, and divine—and factors that alter its intensity, such as age, sex, and mental condition. His analysis is perceptive and comprehensive, particularly considering that he was a contemporary of Mather and Wesley. This separation of suffering into physical and mental components facilitated the scientific study and medical management of pain.

Though works by Locke, Bentham, and Mill were not read by many, they did influence people in posts of power. Thomas Jefferson changed Locke's phrase "life, liberty and estate" to "life, liberty, and the pursuit of happiness," a pertinent transformation. Bentham's book, *An Introduction to the Principles of Morals and Legislation*,⁵² first published in 1780, was revised, expanded, and reissued in 1789, 1823, and 1838. It is said to have brought order to a chaotic penal system and to have influenced social legislation for the next century and a half through its effect on politicians such as Lord Shaftesbury and Robert Peel.⁵⁵ This is not to say that needless cruelty suddenly disappeared from Western society; much of the legislation arising from the humanitarian movement was not enacted until almost half a century later. However, in 1820 there began a concerted move to restrict suffering, a move not previously evident.

CHANGES IN SCIENCE AND MEDICINE

Physicians too were affected by the new humanitarian philosophy. Many who were prominent in the development of anesthesia were active in social causes. Benjamin Ward Richardson, biographer of John Snow, was awarded a special medal for his work on behalf of the Royal Society for Prevention of Cruelty to Animals; John Warren, the Boston surgeon who operated on the patient that Morton anesthetized, played a similar role in the United States.⁴⁹ Walter Channing, the obstetrician

who promoted anesthesia for childbirth in the United States, was the brother of William Ellery Channing, a Boston clergyman active in labor reform and the anti-slavery movement, and was a friend of Oliver Wendell Holmes, the anatomist who became a writer and a chief justice and who coined the term "anesthesia."⁵⁶

Changes in medical science during the 19th century and the secularization of pain reinforced each other and the ideas expressed by Bentham, that physical and mental diseases were distinct and that physical pain was only one component of suffering. Until the later part of the Enlightenment, concepts of disease were dominated by the humoral theory that disease was an imbalance in the four elements: earth, air, fire, and water.^{14,34} According to this scheme, all disease was systemic; disruptions of the spirit were inextricably bound with those of the body. This spirit-body tie was the basis for clerical involvement in the care of the sick.^{16,17}

The connections between disease and religion changed suddenly in the early 19th century. "Heroic medicine," which encompassed cupping, purging, blistering, and bleeding, was supplanted by Bichat's idea that each organ had a specific function, which, if disrupted, caused a disease with distinctive signs and symptoms. This led to the development of physical diagnosis by Laënnec and of organ and cellular pathology by Rokitansky and Virchow. In 1811, Sir Charles Bell published evidence that dorsal and ventral roots of the spinal cord had different functions. Shortly after that, Legallois localized the respiratory center in the brain stem (1812), Flourens identified the cerebellum as the site where body movement was coordinated (1824), and the great German physiologist, Johannes Müller, elaborated his doctrine of specific nerve energy (1826), the idea that each sense organ, regardless of the nature of the stimulus, gives rise to specific sensation. Meanwhile, clinical work by John Abercrombie (1828) and Richard Bright (1831) identified a relationship between lesions in specific areas of the brain and recognizable physical disorders.

As neurology and neuroanatomy developed, pain evolved from a poorly defined condition to a physical entity.⁵⁷ The first suggestion that pain was mediated by specific pathways was made in 1846, the year of Morton's triumph.^{58,59} Between 1800 and 1850 anatomy and physiology developed to the point that pain was a purely biologic phenomenon, devoid of religious connotation. Therefore, pain could be managed by the methods that had such resounding success in science and industry.

A parallel advance in the perception of mental illness also occurred. Through the Middle Ages, the insane were thought to be possessed by the devil. Accordingly, they were exorcised, if they were lucky, or subject to harsh, cruel treatment, justified because insanity was a manifestation of "sin" that deserved punishment.^{60,61}

However, early in the 19th century, Pinel, a Frenchman, and Benjamin Rush, a co-signer of the Declaration of Independence, each espoused the idea that insanity was a disease, not a consequence of sin, that was worsened, if not caused, by the environment. They suggested that conditions in hospitals be improved and methods of treating the insane be kinder, not just for humanitarian reasons, but because such treatment was therapeutic. McLean Hospital in Massachusetts was built on this premise. By mid-century the idea generally was accepted.

Two aspects of this movement deserve comment. First, as treatment became humane, mental disease, like physical disease, became secularized and treatment of the insane devolved from priests to physicians. The clergy were early advocates of Rush's "moral therapy," but later their participation was attacked. During a national conference of administrators of mental hospitals in 1846, some suggested the clergy should be banned from hospital staffs because moral preachments often disturbed patients. The secularization of mental illness reached an apogee with the publication of the theories of Bauer and Freud by the end of the century.

Second, physicians sought an active role in the therapy of the insane and aggressively used hospital design and therapeutic techniques as tools. This paralleled the aggressive approach to physical pain, first by using morphine and later anesthesia. Serturmer isolated morphine and other alkaloids from opium in 1809, which made parental administration possible.⁶² By 1845 morphine was given subcutaneously, at first, simply by rubbing it on abraded skin but later by injecting it with needle and syringe.⁶³ According to accepted theory, the injection was most effective when given as close as possible to the source of the pain, which reflects, perhaps, the idea of specific pain receptors and pathways.

By 1845 narcotics were prescribed often: medical journals were replete with articles describing new indications for the drugs. Narcotics often appeared in patent medicines used for minor childhood complaints or simply as pacifiers—heavy infant drugging was commonplace.⁴³⁻⁴⁵ Predictably, problems of addiction developed, but its hazards were not recognized until later in the century.⁶³ Thus, the Victorians developed a propensity to treat problems with drugs, which may explain Karl Marx's analogy, "Religion is the opium of the people," written in 1846.

SOCIAL AND MEDICAL DEVELOPMENTS AND THE ACCEPTANCE OF ANESTHESIA

Given the chronology of these events, it is easy to understand why Davy, Faraday, and Hickman failed where Morton succeeded; they presented the concept of surgical anesthesia before amelioration of pain had

become a social goal. Morton also may have had the advantage of geography. France and England produced Rousseau, Locke, and Bentham, whose work influenced the intelligentsia. But the United States was the first country to make "the pursuit of happiness" a political right for all its people. In addition, by 1846 people of the United States were riding a wave of optimism and enthusiasm brought on by the success of their great political experiment, by their recovery from the economic depression of 1837-1842, by their access to the untapped resources of a new continent, and by a new sense of self-reliance fostered, as Gabriel has suggested,⁶⁴ by their experience in dealing with the isolation of wilderness life. Edward H. Clarke, Professor of Medicine at Harvard, commented on this association in 1876⁶⁵:

The American Revolution, the forerunner of political changes of the greatest character in Europe as well as in America, was coincident with this new departure in medicine . . . The faith of Christendom has been, and is, crystalizing into new forms and moving to new issues. It is not an extravagant assertion to say that in all this turmoil, change and progress medicine has kept abreast of the other natural sciences, of politics and of theology and has made equal conquests over authority, error and tradition . . . Such has been the progress . . . and . . . achievements of medical science . . . to justify the enthusiastic regard in which physicians hold their profession and to deserve the gratitude of mankind.

Confidence in science and medicine led to scientific investigation, societies, and journals. This also happened in Europe, but the character of the American movement was different. It reflected, in part, the political philosophy of Jacksonian populism^{14,41}; American government and private agencies gave support to science that was "useful," not theoretic, to that which had immediate benefit to the general populace. That anesthesia was consistent with this is attested to by the money Morton was awarded by the United States Congress.

The failure of Crawford Long is more difficult to explain. In all likelihood he was better prepared than Morton to recognize the significance of ether. Long studied at the University of Pennsylvania, in Philadelphia, one of the foremost medical schools of the day, and traveled to New York City to observe the practice of medicine. Physicians in both cities were well aware of the French developments in science and medicine that gave rise to the modern era. Since the French government had supported the American Revolution, the two countries had close ties. American physicians traveled to France rather than England to complete their medical training, and French medical publications were translated and published in the United States.¹⁴ Long had exposure to all this through his travel.

However, Long presented surgical anesthesia to a provincial community, a bastion of traditional Protestantism where the perception of pain was closer to that

of the 18th century than that of the 19th. Long's daughter wrote that the patients in Jefferson, Georgia, were more willing to accept mesmerism than ether for surgery, and Long said medical colleagues advised him to desist in his investigations.^{9,10} Morton, though less well educated than Long, gave his demonstration before a group of the most sophisticated, best-traveled, and best-read physicians in the United States.³⁹

The Present

Since 1850 disease and pain have remained predominantly secular. Consider comments such as these from eminent scientists. Pain is a "representation in consciousness of a change produced in a nerve center by a special mode of excitation . . . a mental state . . . due to the perception of an injury to the body or a feeling"⁶⁶ or a "physical adjunct of an imperative protective reflex."⁶⁷ "There seems to be little doubt that the warnings which pain furnishes lengthen life more than the actual suffering shortens it."⁶⁸ (Would Barcroft have written this before the "therapeutic revolution" of the 19th century?) Thomas Lewis simply said, "Reflection tells me that I am so far from being able satisfactorily to define pain . . . that the attempt would serve no useful purpose . . . We have no knowledge of pain beyond that derived from human experience."⁶⁹

Pain is treated similarly in literature. Emily Dickinson (1830–1886) said, "Pain—has an Element of Blank"⁷⁰ and compared it to an "Hour of Lead—/Remembered, if outlived,—/As Freezing persons, recollect the Snow—/First—chill—then Stupor—then the letting go."⁷¹ Recently, W. H. Auden (1907–1963) wrote⁷²:

About suffering they never were wrong,
The Old Masters; how well they understood
Its human position, how it takes place
While someone else is eating or opening a window or just
walking dully along.

According to V. S. Naipaul, "Pleasure and pain—and above all, pain—had no meaning; to possess pain was as meaningless as to chase pleasure."⁷³ C. S. Lewis, the lay theologian simply said, "Pain is one of those awkward facts which must be fit into any system."¹¹ None of these statements refers to pain as moral or religious. But as pain and suffering have been perceived as natural processes, it has become necessary to reconcile innocent suffering with the idea of a good and all-powerful God, a subject of several recent books.^{74,75}

An interesting, evolution also has occurred in the perception of who has the power to pardon sin and alleviate pain. Initially, God did both. He created laws, judged sin, dispensed pain, pardoned sin, and healed. By the Middle Ages, sin was still a breach of God's laws, but the authority to pardon sin and treat its consequence,

disease, passed to priests. By the Renaissance, civil officers had gained some of the priest's power: they pardoned convicted criminals from cruel punishment, often without regard for the merits of the case, because civil mercy was expected to be like God's mercy, complete, gratuitous, and unexpected.²⁴ By the early 19th century, treating physical disease was in the hands of physicians and by the end of that century mending mental anguish and relieving feelings of guilt in the hands of psychiatrists.

In the past few decades, the authority to minister to the sick has devolved even further to the patient. Those in physical pain may seek to relieve it through techniques of "biofeedback" or self-administration of a variety of drugs from aspirin to narcotics and those in mental anguish through tranquilizers, stimulants, "mind expanding drugs," or encounter groups. Concurrently, words associated with illness have also evolved. "Patient"—a word derived from the Latin, *patior*, which means to endure suffering or pain—is being replaced by "client," a term from the secular marketplace, and "physicians" have become "health care providers." Not only is the secularization of pain complete, but the relief of pain lies in the hands of the sufferer. Does this imply that every person now also must pardon his or her own sin?

Our attitudes toward pain continue to change. Some have commented on the tendency of physicians to prescribe narcotics less often or to expect patients to endure. If the recent popularity of acupuncture and natural childbirth are accurate indicators, expectations of patients also may be different. New attitudes may be due in part to an altered sense of optimism and progress, the second factor important in the development of anesthesia. In the mid 19th century, people were willing to experiment because they believed that permanent gain from these endeavors outweighed temporary disruptions: the fruits of industrialization outweighed slagheaps and foul air, and the gain from colonial markets justified the subjugation of the people. Similarly, the advantages of drugs exceeded their untoward effects: although liver toxicity of chloroform was recognized early, the drug still was used because it was easy to administer; despite warnings about the effects of drugs on the unborn child, women demanded relief from childbirth pain.⁷⁶ But in the past few decades, experience has tempered the heedless pursuit of progress. Regulations that now govern industry and medicine reflect a conservatism or skepticism. In fact, it is moot whether Morton would have succeeded in a social climate such as we have today.

The author acknowledges the help and constructive criticism of J. S. Gravenstein, M.D., D. A. Paulus, M. D., J. A. R. MacKenzie, Ph.D., R. S. Dietrich, D.Min., R. L. Caton, and C. A. Caton and the

members of the WWW, especially C. J. Sommerville, Ph.D., who suggested so many useful references.

References

1. Kuhn TS: *The Structure of Scientific Revolutions*. Chicago, The University of Chicago Press, 1970
2. Sykes WS: *Essays on the First Hundred Years of Anaesthesia*, vol 1. New York, Churchill Livingstone, 1982, pp 48-76, 117-136
3. Frankel WK: The introduction of general anesthesia in Germany. *J Hist Med* 1:612-617, 1946
4. Hume EH: Peter Parker and the introduction of anaesthesia into China. *J Hist Med* 1:670-674, 1946
5. Bigelow HJ: A history of the discovery of modern anaesthesia, A Century of American Medicine 1776-1876. Edited by Clarke EH, Bigelow HJ, Gross SD, Thomas TG, Billings JS. Brinklow, Old Hickory Bookshop, 1876, pp 175-112
6. Keys TE: *The History of Surgical Anesthesia*. New York, Dover Publication, 1963
7. Trent JC: Surgical anesthesia 1846-1946. *J Hist Med* 1:505-514, 1946
8. Smith WDA: *Under the Influence: A History of Nitrous Oxide and Oxygen Anaesthesia*. Park Ridge, Illinois, The Wood Library-Museum of Anesthesiology, 1982, pp 30, 2
9. Taylor FL: Crawford Williamson Long. *Ann Med Hist* 7:267-296, 394-424, 1925
10. Boland FK: *The First Anesthetic. The Story of Crawford Long*. Athens, University of Georgia Press, 1950
11. Lewis CS: *The Problem of Pain*. New York, Macmillan, 1962, p 16
12. Milton J: *Paradise Lost*, book I, line 3, *The Complete Poetical Works*. New York, Thomas Y Crowell, 1892, p 43
13. Dawson GG: *Healing: Pagan and Christian*. New York, AMS Press, 1977
14. Shryock RH: *Medicine in America. Historical Essays*. Baltimore, Johns Hopkins Press, 1966
15. Gottfried RS: *The Black Death. Natural and Human Disaster in Medieval Europe*. New York, Free Press, 1983
16. Beall OT Jr, Shryock RH: Cotton Mather: First Significant Figure in American Medicine. Baltimore, Johns Hopkins Press, 1954
17. Wesley J: *Primitive Remedies*. Santa Barbara, Col Woodbridge Press, 1975
18. Starr P: *The Social Transformation of American Medicine*. New York, Basic Books, 1982, pp 39-40
19. Boccaccio G: *The Decameron*. Edited by Allison R. New York, Dell, 1980, pp 30-31
20. Bartsocas CS: Two fourteenth century Greek descriptions of the "Black Death." *J Hist Med* 21:394-400, 1966
21. Cohn N: *The Pursuit of the Millennium*. New York, Oxford University Press, 1970
22. Ziegler P: *The Black Death*. New York, Harper and Row, 1969
23. Thomas K: *Religion and the Decline of Magic*. New York, Charles Scribner's Sons, 1971
24. Huizinga J: *The Waning of the Middle Ages*. New York, Doubleday, 1954
25. Cipolla CM: *Faith, Reason, and the Plague in Seventeenth-Century Tuscany*. New York, WW Norton, 1981
26. Donne J: *An anatomy of the world, The Complete English Poems*. Edited by Smith AJ. New York, Penguin Books, 1981, p 273
27. Poynter FNL: John Donne and William Harvey. *J Hist Med* 15: 233-246, 1960
28. Chadwick O: *The Secularization of the European Mind in the Nineteenth Century*. New York, Cambridge University Press, 1977
29. James W: *The Varieties of Religious Experience. A Study in Human Nature*. New York, Penguin Books, 1982, pp 297-298
30. Hales S: *Statical Essays: Containing Haemastaticks*. New York, Hafner, 1964, pp xix-xx
31. Gay P: *The Enlightenment: An Interpretation. The Rise of Modern Paganism*. New York, WW Norton, 1977, p 6
32. Nisbet R: *History of the Idea of Progress*. New York, Basic Books, 1970
33. Bacon F: *Of fortune, Selected Writings*. Edited by Dick HG. New York, Random House, 1955, p 105
34. King LS: *The Philosophy of Medicine. The Early Eighteenth Century*. Cambridge, Harvard University Press, 1978
35. Blake W: *On another's sorrow, The Complete Poetry and Prose of William Blake*. Edited by Erdman DV. New York, Anchor Press/Doubleday, 1982, p 17
36. Blake W: *Visions of the daughters of Albion, The Complete Poetry and Prose of William Blake*. Edited by Erdman DV. New York, Anchor Press/Doubleday, 1982, p 49
37. Wordsworth W: *Ode on intimations of immortality from recollections of early childhood, The Literature of England*. Edited by Woods GB, Watt HA, Anderson GK. Chicago, Scott Foresman, 1953, p 681
38. Himmelfarb G: *The Idea of Poverty. England in the Early Industrial Age*. New York, Alfred A Knopf, 1984
39. Booth CC: *Clinical science in the age of reason. Perspect Biol Med* 25:93-114, 1981
40. Droz J: *Europe Between Revolutions, 1815-1848*. New York, Cornell University Press, 1980
41. Daniels GH: *American Science in the Age of Jackson*. New York, Columbia University Press, 1968
42. Greene NM: A consideration of factors in the discovery of anesthesia and their effects on its development. *ANESTHESIOLOGY* 35:515-522, 1971
43. Sommerville CJ: *The Rise and Fall of Childhood*. Beverly Hills, Sage Publications, 1982
44. Pinchbeck I, Hewitt M: *Children in English Society*, vol 2. London, Routledge and Kegan Paul, and Toronto, University of Toronto Press, 1973
45. Walvin J: *A Child's World. A Social History of English Childhood 1800-1914*. New York, Penguin Books, 1982
46. Schiller J: *Claude Bernard and vivisection. J Hist Med* 45:246-260, 1967
47. Stevenson LG: Religious elements in the background of the British anti-vivisection movement. *Yale J Biol Med* 29:125-157, 1956
48. Rowan AN, Rollins BE: Animal research for and against: A philosophical, social, and historical perspective. *Perspect Biol Med* 27:1-17, Autumn 1983
49. Turner J: *Reckoning with the Beast*. Baltimore, Johns Hopkins Press, 1980
50. Vidler AR: *The Church in an Age of Revolution*. New York, Penguin Books, 1980
51. Locke J: *An Essay Concerning Human Understanding*. London, Everyman's Library, 1947, pp 16, 40, 41, 55
52. Bentham J: *An Introduction to the Principles of Morals and Legislation*. Edited by Burons JH, Hart HLA. New York, Methuen, 1982, p 34
53. Mill JS: *Nature, The Philosophy of John Stuart Mill*. Edited by Cohen M. New York, Modern Library, 1961, pp 463-467
54. Mill JS: *Utilitarianism, The Philosophy of John Stuart Mill*.

- Edited by Cohen M. New York, Modern Library, 1961, p 330
55. Webb RK: Modern England: From the Eighteenth Century to the Present. New York, Harper and Row, 1908
 56. Caton D: Obstetric anesthesia: The first ten years. *ANESTHESIOLOGY* 33:102-109, 1970
 57. McHenry LC: Garrison's History of Neurology. Springfield, Charles C Thomas, 1969
 58. Dallenbach KM: Pain: history and present status. *Am J Psychol* 52:331-347, 1939
 59. Beecher HK: The measurement of pain. *Pharmacol Rev* 9:59-209, 1957
 60. Neaman JS: Suggestion of the Devil. Insanity in the Middle Ages and the Twentieth Century. New York, Octagon Books, 1978
 61. Dain N: Concepts of Insanity in the United States 1789-1865. New Brunswick, Rutgers University Press, 1964
 62. von Serturrner FW: Ueber das Morphium, eine neue Salzsahige Grundlage, und die Mekonsaure, als Hauptbestandtheile des Opiums. *J Pharmacol* 14:47-93, 1806
 63. Kane HH: The Hypodermic Injection of Morphia. New York, CL Bermingham, 1880
 64. Gabriel RH: The Course of American Democratic Thought, second edition. New York, Ronald Press, 1956
 65. Clarke EH: Practical medicine, A Century of American Medicine 1776-1876. Edited by Clarke EH, Bigelow HJ, Gross SD, Thomas TC, Billings JS. Brinklow, Old Hickory Bookstore, 1876, pp 2-72
 66. Behan RJ: Pain. New York, Century Appleton, 1915, p 18
 67. Sherrington C: The Integrative Action of the Nervous System. New Haven, Yale University Press, 1961, p 229
 68. Barcroft J: Features in the Architecture of Physiologic Function. New York, Hafner, 1972, p 357
 69. Lewis T: Pain. New York, Macmillan, 1942, pp v-vii
 70. Dickinson E: Poem 650, The Complete Poems of Emily Dickinson. Edited by Johnson TH. Boston, Little Brown, 1960, p 323
 71. Dickinson E: Poem 341, The Complete Poems of Emily Dickinson. Edited by Johnson TH. Boston, Little Brown, 1960, p 162
 72. Auden WH: Musee des beaux arts, Selected Poems. Edited by Mendelson E. New York, Vintage Books, 1979, p 79
 73. Naipaul VS: A Bend in the River. New York, Vintage Books, 1980, p 222
 74. Lewis CS: A Grief Remembered. New York, Bantam Books, 1980
 75. Kushner HS: When Bad Things Happen to Good People. New York, Schocken Books, 1981
 76. Caton D: Obstetric anesthesia and concepts of placental transport: A historical review of the nineteenth century. *ANESTHESIOLOGY* 46:132-137, 1977