Annals of Anesthetic History

Obstetric Anesthesia:

The First Ten Years

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Prolonged controversy followed the introduction of obstetric anesthesia into medicine. From the beginning, many physicians expressed concern that the pain of surgery and the pain of childbirth are not comparable and, therefore, should not be treated in the same way with anesthetic drugs. Indeed, skeptics seemed on firm ground when they argued that surgery with its attendant pain, is undertaken to correct pathologic processes; whereas childbirth with its pain, represents the culmination of the process of reproduction; a universal biological phenomenon. In other words, pain as a protective mechanism may have different functions in pathologic processes and in childbirth. (Key words: Obstetric anesthesia; History.)

ANESTHESIA FOR LABOR and delivery has always seemed a bit apart from the rest of the specialty.

To identify the features peculiar to obstetric anesthesia which separate it from the rest of anesthesia in substance as well as in name, I have traced the historical development of the field. The perspective I have gained has enabled me to identify at least one of the features that give obstetric anesthesia a special place.

James Young Simpson, of Scotland, administered the first modern anesthetic, diethyl ether, to a woman in labor in 1847. This innovation met with widespread opposition. Several anecdotes describe the nature of the opposition and the way in which Simpson overcame it. Apparently, the opposition came from two groups, the clergy, who quoted the Book of Genesis as proof that God willed Eve's descendants to suffer in labor; and the lay public, who thought obstetric anesthesia somehow smacked of immorality.

Simpson quieted conservative prelates by pointing out that God "anesthetized" Adam for the delivery of Eve. He then called attention to the fact that the Bible actually said that Eve "In sorrow shalt bring forth children." [1] A scholar in his own right, he observed that the word "sorrow" in Hebrew had two meanings. It meant "to suffer," but it also meant "to work." Therefore, he argued, the passage could be interpreted to mean that women, henceforth, were "to work" during labor rather than to mean they were to experience pain. The other popular story of the beginning of obstetric anesthesia related how Simpson won the support of the lay public when Queen Victoria requested and received anesthesia for the birth of her seventh child, Prince Leopold.

The strongest opposition to Simpson's innovation came not from the church or the lay public, but from respected members of the medical community. Chief spokesman for this opposition was an American, Charles Delucina Meigs, of Philadelphia. Both Simpson and Meigs were colorful and influential men. Since the development of obstetric anesthesia was shaped by their personalities as well as their thoughts, it seems appropriate to relate some details of their personal lives.

James Young Simpson

It would be hard to imagine anyone better suited than Simpson for a protracted controversy. In fact, some contemporaries suggested Simpson was destined for a life of contention since he was "born in a land of thistles and nurtured in a city where controversy and partisanship attended portentous developments, where elections (were) fierce battles, and their intervals, times not so much at peace as of preparation." [2]

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Simpson was born at the beginning of the nineteenth century in the small town of Bathgate, just outside Edinburgh, the sixth child of a not very prosperous baker. As was the custom among poor families of Scotland of the day, the clan took stock and decided who among them was the most likely to win renown for the family name; their choice was James. As he grew, they sacrificed and pooled resources to provide him with books and an education.[3a] He repaid their sacrifice well. He graduated from the School of Medicine, University of Edinburgh, and began practice in the same city.

When Simpson was 29 years old, the Chair of Midwifery in the medical school fell vacant. James, and several others, sought appointment to the chair. Simpson was a prime contender and eventually won the position over older, more experienced, better known physicians by telling the Board of Electors (apparently with a great deal of force and candor) that he was the best possible candidate they would ever find.

Fortunately, Simpson possessed qualities other than modesty. Colleagues described him as a competent physician and a man of warmth and charm; as one who had a facile mind and a commanding physical presence (fig. 1). Of Simpson's appearance one contemporary wrote: "The chair was occupied by a young man whose appearance was striking and peculiar. As he entered the room his head was bent down and little was seen but a mass of long tangled hair, partially concealing what appeared to be a head of very large size. He raised his head and his countenance impressed one as that of a pale face, massive bent brows from under which stone eyes now piercing as it were to your innermost soul, now melting into almost feminine tenderness. And finally, now his mouth would seem the most expressive feature of the face. Then his peculiar rounded soft body and limbs, as if he had retained the infantile form in adolescence. All of this presented an ensemble which, even if we had never seen it again, would have remained indelibly impressed on our memory." [3b] Another contemporary said a bit more succinctly, "Simpson had the head of Jove and the body of Bacchus." [4] No doubt all these personal qualities helped Simpson to win people to the cause of obstetric anesthesia, just as his dogged Scottish determination helped him to hold their favor, once won over.

FIG. 1. James Young Simpson (courtesy of the Yale Medical History Library).

Charles Delucina Meigs

The leader of Simpson's opposition was Charles Delucina Meigs (fig. 2), an American. He was a direct descendant of Vincent Meigs, who traveled from England to settle on the shores of the Hammonsett River in Connecticut, in 1649.

Charles was born into a family that seemed to thrive in an atmosphere of controversy. Several uncles were prominent in the Revolutionary War. Charles' own father (Josiah) had a checkered career, first as a professor of mathematics and natural philosophy at Yale, later as the first president of the University of Georgia. Josiah Meigs resigned from both these positions in the midst of controversies precipitated by moral and political issues over which he disagreed with his colleagues.[5, 6]

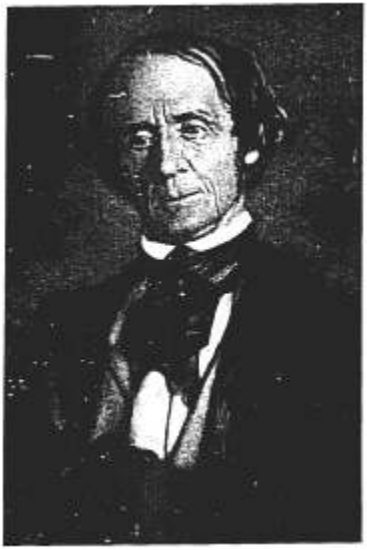


FIG. 2. Charles D. Meigs (courtesy of the Yale Medical History Library).

Charles was educated at the University of Georgia, then in Philadelphia, where he received the medical degree from the University of Pennsylvania. Following graduation, he practiced for two years in Atlanta, returning then to Philadelphia to specialize in obstetrics. Within a short time, he had established a solid reputation as an authority in obstetrics by the publication of several textbooks which became very popular both here and in Europe. The frontispiece of one of them [7] is shown in figure 3.

In 1842, Meigs sought, but did not receive, appointment to the Chair of Obstetrics at the University of Pennsylvania. The following year, however, he was appointed Professor and Chairman of the Department of Obstetrics at the recently-founded Jefferson Medical College.[8]

In personality, Charles Meigs was a true descendant of his forebears. Within two years of appointment as professor at Jefferson, he became the central figure, not only in the controversy with Simpson over obstetric anesthesia, but also in a controversy with Oliver Wendell Holmes over the contagious nature of childbed fever. Because of his stand on both these issues, generations of medical historians have put Meigs in league with those who oppose motherhood and apple pie. However, it is important to remember that Meigs was not alone in his stand on either issue. He spoke for respected members of the medical community. Moreover, all he did was to ask Simpson to demonstrate the safety of this radically new form of medical therapy, obstetric anesthesia. Because Meigs was a man of strong character and firm conviction, he was not swayed by arguments which he thought were based on fallacious reasoning. In both personal and professional stature, then, he was an effective foil to Simpson.

Significance of Pain in Childbirth

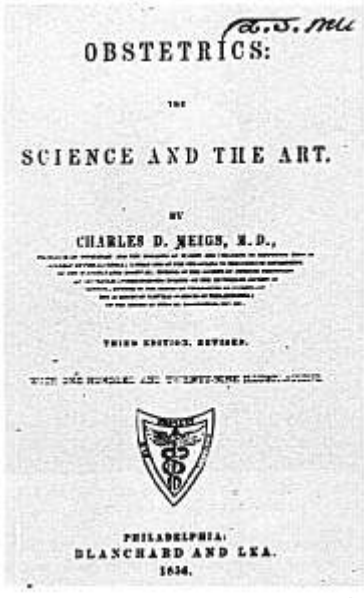
Meigs took issue with Simpson on two major points: first, the significance of pain in normal labor, and second, the wisdom of employing dangerous drugs in a process that usually terminates so well. To Meigs, childbirth was a natural, biological phenomenon; moreover, pain was a normal part of the process. As Meigs said, he had "no doubt of some physiological and therefore needful and useful connection of the pain and powers of parturition." [9] Thus, he implied that pain might, in part, be biologically necessary and medically desirable. Moreover, in abolishing pain, he believed the physician invited the risk of upsetting mechanisms of parturition that otherwise would proceed in a normal fashion.[7]

Simpson's view of the significance of pain during childbirth was diametrically opposed to that of Meigs. Simpson quoted Galen, agreeing with him that, whatever its origin, "pain is useless to the pained." Simpson felt that pain had no necessary relationship to any physiologic aspect of parturition, saying that "Each so-called labor pain consists of two distinct and separate elements; first of contractions of the uterus and secondly, sensations of pain."[10a] Even more than useless, Simpson believed that pain, "Whenever great in degree or great in duration was in itself deleterious." [10b] To support this opinion he offered two arguments. First, it was his impression

that patients recovering from surgical operations performed under anesthesia were up and about sooner than those who did not have anesthesia. Second, he presented statistics which showed a decrease in mortality from 50 to 25 per cent with the use of anesthesia for thigh amputation. He attributed the more rapid postoperative recovery and the drop in operative mortality solely to the obliteration of pain. Furthermore, "What held good in relation to pain in surgery held good in relation to midwifery because the mortality accompanying labor is regulated primarily by the length and degree of the patient's previous suffering."[10c] Thus, Simpson believed that there was no biological reason or advantage to pain during childbirth. Moreover, the effects of pain were only deleterious. To him, then, obstetric anesthesia was an unmixed blessing.

Simpson's arguments were based on a number of equivocal assumptions, and his opponents were quick to point them out.[11] For example, he implied that, without anesthesia, the mortality rate following thigh amputation and the mortality rate accompanying childbirth were comparable. As a matter of fact, in the year prior to Morton's demonstration of the anesthetic properties of ether, Simpson had published a maternal mortality figure in his own hospital of only 11 deaths in 1,400 deliveries.[12] This figure may seem high by present standards, but it was hardly comparable to the 50 per cent mortality he had given for thigh amputation. In a similar vein, Simpson assumed that the pain of childbirth affected the body in the same manner as the pain experienced during surgical operations. Similarly, he assumed that anesthesia would be as effective in decreasing morbidity and mortality in obstetrics as it appeared to have been in surgery. Finally, Simpson assumed, without proof, that pain could be abolished without affecting the normal progress of labor. A number of physicians challenged Simpson on these points. Despite this, Simpson never published any further information to justify his assumptions.

In the light of subsequent events, it is now difficult to be critical of Simpson's failing to present further evidence to justify his position. He did let the issue of pain drop; but then, so did his opponents. Despite the fact that for


OBSTETRICS:

THE

SCIENCE AND THE ART.

BY

CHARLES D. MEIGS, M.D.,

THIRD EDITION, REVISED.

PHILADELPHIA:
BLANCHARD AND LEA.
1856.

FIG. 3. Frontispiece from Charles Meigs' textbook, *Obstetrics: The Science and the Art.*

the first time in history physicians had a tool, anesthesia, capable of controlling and obliterating obstetric pain, neither Simpson nor his critics used this tool to study pain or to determine its effects. Thus, they never did decide whether, in labor, pain was physiologically advantageous or harmful.

Simpson, Meigs, and the others shifted their attention to a different area. They ceased speculating on the effects of pain on childbirth and, instead, sought to understand the effects of anesthesia on childbirth. For example, Simpson wrote, "it will be necessary to ascertain anesthesia's precise effects, both upon the action of the uterus and on the assistant abdominal muscles; its influence, if any, upon the child; whether it had a tendency to hemorrhage or other complications."[10d] Several other prominent obstetricians picked up this theme. Among them were Baron Paul Dubois,[13] of the Faculty of Paris, and Walter

FIG. 4. Walter Channing (courtesy of the Yale Medical History Library).

Channing, of Harvard. Channing, in fact, dealt with these questions in a book which subsequently became a classic in the history of obstetric anesthesia.

Walter Channing

Channing's stature in medicine was no less than that of Meigs and Simpson.[14] One of three sons of a prominent Newport, Rhode Island, family, Channing (fig. 4) attended Harvard College, but was expelled in 1805 (without a degree) for his part in the student Bread and Butter Rebellion.* Following expulsion, Channing enrolled at the University of Pennsylvania where he earned the Doctorate in Medicine. He then returned to Harvard, soon became Professor of Obstetrics and Medical Jurisprudence. Channing was appointed to this position a scant 13 years after expulsion from Harvard as an undergraduate. A year later, he was appointed Dean of Harvard Medical School, a position he held until 1847.

Channing was a liberal. His older brother, William Ellery Channing, in the early nineteenth century headed a liberal church movement that eventually led to the foundation of the Unitarian Church in America. Channing, the obstetrician, was an intimate of such New England liberals as Henry David Thoreau and Ralph Waldo Emerson. (He also knew Oliver Wendell Holmes, who was appointed to the medical faculty of Harvard during Channing's tenure as Dean.)

Channing's liberal tendencies are apparent in his book on obstetric anesthesia[16] (fig. 5). According to the introduction, he undertook the work to decide whether anesthesia was "safe, both to mother and to child." He endeavored to settle these issues by means of a questionnaire submitted to Boston physicians, inquiring about their experiences with obstetric anesthesia. His catalogue of their responses, tempered with his own experiences with anesthesia, was published in book form. The book proved to be an overwhelming endorsement of obstetric anesthesia and Simpson's position. However, what the book gained by the force of this endorsement, it lost by lack of objectivity. Toward the end of the book, for example, Channing admitted that he had left out any responses to the questionnaire which were derogatory to anesthesia, since he thought these probably were not very important and others would probably write about them anyway. Regardless of the shortcomings of the book, it was a major stimulus to the development of obstetric anesthesia; in fact, it is the chief reason Channing is remembered today.

Effects of Anesthesia on Parturition

Channing, Meigs, and Simpson asked important questions about the effects of anesthesia on labor, the infant, and the mother. However, they seemed to encounter great difficulty in finding adequate answers. In surgery, it had been relatively easy to judge anes-

* The issues which led to the rebellion, and to Channing's expulsion, are somewhat blurred. However, the following poem that appeared in the "Harvard Crimson" describes the beginning of the confrontation:

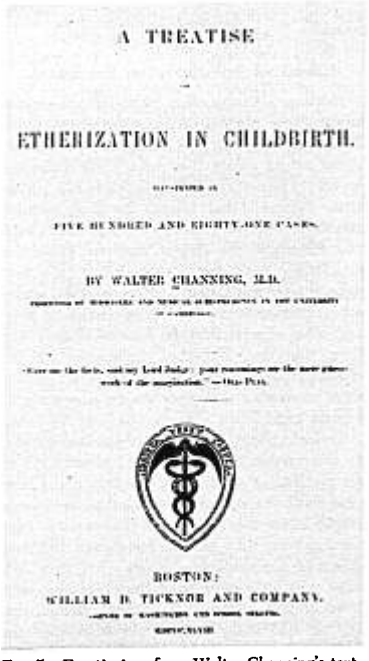
Nathan threw a piece of bread
And hit Abijah on the head.
The wrathful freshman in a trice
Sent back another bigger slice
Which being buttered pretty well
Made greasy work where ere it fell.
And thus arose a fearful battle
With coffee cups and saucers rattled.
The bread bowls fly at woeful rate
And break many a learned pate.[15]

thesia's worth: either it relieved pain or it did not; either the patient survived or he did not. The end-points were fairly clear.

In obstetrics, however, the end-points were not so clear. It was true that anesthesia could abolish the pain of childbirth. However, no one knew whether it could do so without disturbing the physiologic processes of parturition. To determine this, physicians had, in effect, to determine the dose–response relationship between anesthesia and the mechanisms of childbirth. Hopefully, with that information, they could then decide whether childbirth was safer with or without anesthesia. Unfortunately, they had no means to measure either anesthetic dose or physiologic response. For example, the method used by most physicians for anesthesia during labor and delivery was that described by Simpson, dropping ether or chloroform onto a handkerchief placed over the patient's nose and mouth. Many patients received anesthesia for hours—during almost the whole course of labor and delivery. Sometimes, during long labor, physicians turned over administration of the anesthetic to the patient's husband, or anyone else standing nearby. One could hardly expect such a technique and attitude to lead to any observations helpful in correlating anesthetic dose and physiologic response. Therefore, it is no surprise to find that some physicians seemed confused by their observations.

Channing, for instance, made conflicting statements about the effects of etherization on uterine contractions. In one paragraph of his book,[16] he wrote that etherization can abolish uterine contractions. He even recommended it be used to control "the persistent contractions so common from ergotism" (p. 43). Despite this, he says that myometrial depression from etherization occurs only in "exceptional cases" (p. 38). Later, he wrote, "Etherization has no necessary effect to diminish the organic action of the womb" (p. 42); two pages after that: "whatever ether's effect on the action of the uterus, it leads to a natural state of uterine function and consequently, (he) welcomes it" (p. 44). Thus, Channing's observations of the effect of ether on the myometrium seemed to confuse rather than clarify his thinking.

Meigs, on the other hand, spoke emphatically about his experience and his interpretation of it. He noted that he had "observed in most experiments that it (etherization) lessened the frequency and power of the pains . . . (to an extent that he) . . . was obliged to lay it aside wholly until the motor powers of the womb, recovering from the stupefying influence, allowed the labor to proceed." [7]


A TREATISE

ETHERIZATION IN CHILDBIRTH.

BY WALTER CHANNING, M.D.

BOSTON:
WILLIAM D. TICKNOR AND COMPANY.

FIG. 5. Frontispiece from Walter Channing's textbook, A Treatise on Etherization in Childbirth.

It seems possible that Channing's confusion, and his divergence from Meigs on this point, may have stemmed from the fact that he had no concept of, or means to measure, anesthetic dosage. Similarly, neither he nor Meigs had a satisfactory way to evaluate myometrial function other than by abdominal palpation of the uterus or by timing duration of labor. Without equivalent techniques to measure these variables, Channing, Meigs, and others had no reliable means to compare their experience.

In such circumstances, controversy was inevitable.

Effects of Anesthesia on the Infant

Dealing with the effect of anesthesia on the infant, these physicians encountered other difficulties. It is true that some suspected anesthesia might affect the child. For example, in 1853, John Snow, Queen Victoria's physician, observed that infants born of mothers anesthetized with chloroform did not "kick and scream in the violent way and grasp the bedclothes with the force, during the first minute after birth, that is often observed under other circumstances." On the basis of this, and other observations, he concluded that "the fetus must be, therefore, influenced by the chloroform, but generally to a lesser extent than its mother as it receives its dose only at second hand."[17]

Unfortunately, few other physicians seemed to share either Snow's power of observation or his insight. For example, Simpson and Channing both expressed concern that anesthesia might affect the newborn. However, in case descriptions, they seldom mentioned the condition of the newborn. Even when they did, they said little more than the child was born alive or that it cried. Channing, in fact, dismissed the idea that ether could cross the placenta because he had smelled the cut ends of the cord and could not detect the odor of ether. For some reason, he did not mention attempting to smell ether on the newborn's breath, although he knew he could thereby detect it in the mother's exhalations.

In retrospect, it appears that several factors may have lulled these physicians into complacency regarding the effects of anesthesia on the newborn. For example, in the mid-nineteenth century, little was known of fetal metabolic requirements. Indeed, the first clear demonstration that fetal tissue consumed oxygen occurred 20 years later. With respect to anesthesia's actions, physicians knew that ether and chloroform altered respiration and heart rate. However, they had no information that would lead them to relate these changes to alterations in blood oxygen content, cardiac output, or blood flow to the uterus and placenta. Similarly, there was then, as now, incomplete understanding of the mechanisms which initiate respiration in the newborn.

With no concept of fetal metabolic requirements, with little understanding of the mechanisms involved in the delivery of metabolic substrates to the fetus, and with only a rudimentary appreciation of the susceptibility of the respiratory, cardiovascular, and central nervous systems to the effects of ether and chloroform, these physicians were ill-prepared to select variables indicative of the condition of the newborn, much less relate them to the drugs administered to the mother during labor and delivery.

Stalemate

The debate between Simpson and Meigs over the safety of anesthesia for childbirth became a stalemate. When the dispute began, they argued about the physiologic role of pain in parturition and the risks entailed in obliterating it with anesthesia. Unsuccessful in dealing with this issue, they proceeded to debate the effects of anesthesia on several other physiologic mechanisms of labor and delivery. Here they failed because they had no satisfactory way to define and measure the functions which concerned them.

Regardless of the state of resolution of the controversy between Meigs and Simpson, anesthesia for obstetrics was accepted. There is reason to believe it was accepted *over* the protests of conservative physicians, for there is no reason to believe the skeptics ever were convinced that their objections were unfounded. Simpson's writings and preachments seemed to be directed primarily toward the lay public, and he won them over. Apparently, it was pressure from the public that eventually caused the medical profession to accept anesthesia for obstetrics. For example, in 1855, William Ramsbotham, a prominent London physician and obstetrician wrote: "Those indeed who are conscientiously opposed to any procedure which had been ushered before the notice of the profession with such acclamation, and has created such an enthusiastic sensation in the public mind as the inhalation of anesthetic vapors during parturition has done, must necessarily have a very hard and uphill work to accomplish in substantiating

their opinions. . . . For the favorable cases are blazoned abroad with all the eagerness inspired by novelty, and received with all the éclat dependent on its presumed success; whilst those (in which) any casualties have occurred are, for the most part, kept back from the eye of the public. . . ." [18] It may be that Simpson anticipated this response and encouraged it, for early in the controversy he wrote: "Obstetricians may oppose it (obstetric anesthesia), but I believe our patients themselves will force the use of it upon the profession." [10e]

In one sense, Charles Meigs lost the dispute. Physicians accepted anesthesia for labor and delivery before they dealt with his objections. In another sense, however, he may have won. Although most physicians now agree that it is not necessary or desirable for the mother to experience conscious pain during childbirth, many have a nagging inkling that pain may be important in initiating, perhaps by reflex, physiologic processes which facilitate a safe and speedy delivery. Similarly, most physicians now are anxious that the drugs given the mother not interfere with responses which help the newborn adapt to extrauterine life. Perhaps this reluctance to interfere with labor and the physiologic processes of delivery is the distinguishing characteristic of obstetric anesthesia. If so, it may represent Charles Meigs's legacy to obstetric anesthesia.

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References

1. Simpson, J. Y.: Answer to the Religious Objections Advanced Against the Employment of Anesthetic Agents in Midwifery and Surgery. Edinburgh, 1847.
2. Obituary, Brit. Med. J., May 14, 1870, p. 505.
3a. Gordon, H. L.: Sir James Simpson. New York, Longmans, Green and Co., 1897.
3b. *Ibid.*, p. 53.
4. Robinson, V.: Pathfinders in Medicine. New York, Medical Life Press, 1924, p. 531.
5. Dexter, F. B.: Biographical Sketches of the Graduates of Yale College with Annals of the College History. Vol. IV, New York, Henry Holt and Co., 1907, p. 43.
6. Kingsley, W. L.: Yale College—A Sketch of its History. Vol. I, New York, Henry Holt and Co., 1879, p. 109.
7. Meigs, C. D.: Obstetrics, the Science and the Art. Philadelphia, Blanchard and Lea, 1865, p. 364–376.
8. Levinson, A.: The three Meigs and their contribution to pediatrics, Ann. Med. Hist. 10: 138, 1928.
9. Meigs, C. D.: Letter to W. Channing, April 26, 1848. *In:* Channing, W.: A Treatise on Etherization in Childbirth. Boston, William Ticknor & Co., 1848.
10a. Simpson, J. Y.: *In* Simpson, W. G. (ed.): The Works of Sir J. Y. Simpson, Vol. II, Anaesthesia, Edinburgh, Adam and Charles Black, 1871, p. 57.
10b. *Ibid.*, p. 112.
10c. *Ibid.*, p. 111.
10d. *Ibid.*, p. 199–200.
10e. *Ibid.*, p. 177.
11. Montgomery, W. F. H.: Objections to the Indiscriminate Administration of Anesthetic Agents in Midwifery. Dublin, Hodges Smith, 1849.
12. Simpson, J. Y.: Report of the Edinburgh Royal Maternity Hospital from 1844 to 1846. Monthly J. Med. Sci., London and Edinburgh, 1848.
13. Dubois, Baron P.: On the inhalation of ether applied to cases of midwifery, Lancet, I: 246, 1847.
14. Thoms, H.: Walter Channing and etherization in childbirth, Am. J. Obstet. Gynec. 20: 244, 1930.
15. Morison, S. E.: Three Centuries of Harvard, 1636–1936. Cambridge, Harvard University Press, 1936, p. 512.
16. Channing, W.: A Treatise on Etherization in Childbirth. Boston, William D. Ticknor and Co., 1848.
17. Snow, J.: On the administration of chloroform during parturition. Assoc. Med. J., London, p. 500, 1853.
18. Ramsbotham, F. H.: The Principles and Practice of Obstetric Medicine and Surgery in Reference to the Process of Parturition. Philadelphia, Blanchard and Lea, 1855, p. 174.