Not an Unmixed Blessing

In evaluating the discovery that volatile agents could dull the pain of surgical operations and produce complete insensibility, it is necessary to look at the situation that existed at the time of the discovery as well as at the long-term results. Today we can say without reservation that the use of drugs to produce anesthesia is a boon to humanity, but in the 1840's this was not so.

As has been pointed out previously, surgery technically at the beginning of the nineteenth century was limited to surface and reparative manipulations and was resorted to only in extreme cases. The seriousness of an operation is indicated by the contents of a notebook covering surgical operations at the New York Hospital from 1808 to 1833, in which there is evidence that a rule promulgated by the Board of Governors of the hospital—to the effect that no operation should be undertaken except after consultation by all the physicians and surgeons—was scrupulously observed. One deterrent, to be sure, was the severing of flesh and the sawing of bone on a conscious person, often in the presence of other patients.

Tenon, in 1788, recorded:

The operating room [Hôtel Dieu, Paris], where they trephine, cut, amputate, contains at once those who have been and are to be operated upon as well as those undergoing operations. They all see the preparations for torture and hear the cries of agony.

In 1811, the surgeons at the Philadelphia Almshouse reported that:

they were compelled to perform severe surgical operations in the room crowded with the sick, and they spoke of the effects of the spectacle upon

---

the suffering audience, as being terrible and cruel. The Board adopted a resolution to secure an apartment to be devoted exclusively to surgical operations.\(^8\)

In all hospitals containing separate rooms for surgery prior to the use of anesthesia, it was a common practice to place the surgical amphitheater in the tower of the building to remove the patient to undergo operation as far as possible from the rest of the hospital, so that the shrieks of agony would not be plainly heard. At the Boston City Hospital, the public operating room was in the cupola and could be reached only by several flights of stairs. Patients were transported by an elevator from the basement to the third floor, then shifted to another elevator and raised to the operating room. Both elevators were operated by hand power.\(^4\)

Such conditions as these certainly provided sufficient reason for the reluctance to resort to surgery prior to the discovery of anesthesia. Yet, another should have carried far more weight. The incidence of death from infection was so high that a fatal outcome without surgical intervention had almost to be assured, or the pain and the disability from injury had to be practically unbearable, for an operation to be attempted by any surgeon of judgment. With the advent of anesthesia and the abolition of the restraining influence of the horrible suffering that had attended operations previously, the increase in the number of operations performed between 1846 and the 1890's, when asepsis was introduced, undoubtedly contributed to a greater surgical mortality. Before the discovery of anesthesia, only 34 patients a year were operated on at the Massachusetts General Hospital; in 5 years the number had tripled.\(^*\) The discovery that ether and chloroform would produce anesthesia was consequently of greater benefit to the surgeon than it was to the patient.

---

\(^8\)Lawrence, Charles: History of the Philadelphia Almshouses and Hospitals, Philadelphia, Charles Lawrence, 1905, p. 58.

\(^4\)History of the Boston City Hospital, Boston, Municipal Printing Office, 1906, p. 245.

\(^*\)From October 16, 1846, to April 1, 1848, 154 operations with anesthesia were performed at the Massachusetts General Hospital; in 8 chloroform was the agent. During approximately the same period 37 cases were reported from the New York Hospital, chloroform being used in 14, ether in 20 and nitrous oxide in 1; in 2 the agent was not stated. At the University of Pennsylvania Hospital ether was used in 10 and chloroform in 3 of 13 operations reported. Out of 45 operations at the Jefferson Medical College in Philadelphia ether was used in 32 and chloroform in 13. (United States Thirtieth Congress, Second Session, House of Representatives, Feb. 23, 1849, Report 114.)
One of the principal obstacles to the technical development of surgery before anesthesia was the need for unnatural speed and dexterity. William Cheselden (1688-1752) is reported to have been able to do a lithotomy in 54 seconds, and Dominique-Jean Larrey (1766-1842), the chief surgeon of Napoleon’s Grande Armée, reputedly performed some amputations in 15 seconds. The advantage in the use of ether or chloroform was to render the patient sufficiently inert for the surgeon to have time to operate with technical proficiency. This could not be accomplished by methods, such as, for example, the use of the carotid sinus reflex, that could not produce controllable unconsciousness over a long period.

Despite the rapidity with which the idea of general anesthesia took hold, not a few practitioners and laymen had their doubts about its being an unmixed blessing.

When anaesthesia was first introduced a great outcry was raised against it from the pulpit because it was said to interfere with the decrees of Providence that mankind should suffer.\(^5\)

The most publicized of these controversies centered in the use of anesthesia to relieve the pain of childbirth, and James Young Simpson, who began to apply it for this purpose at the end of January, 1847, was attacked on the grounds that he was acting in defiance of Divine Will: “In sorrow thou shalt bring forth children.” In refuting this orthodox dependence on scriptural law, Simpson replied:

[The] Hebrew term which, in our English translation of the primeval curse, is rendered “sorrow” (Genesis iii.16), principally signifies the severe muscular efforts and struggles of which parturition—and more particularly human parturition—essentially consists; and does not specially signify the feelings or sensations of pain to which these muscular efforts or contractions give rise.\(^6\)

A serious blow was dealt this segment of the opposition when Queen Victoria was anesthetized in 1853 for the birth of Prince Leopold and again in 1857 for the birth of Princess Beatrice.

A more common-sense denunciation from the pulpit is illustrated in a warning published in the *North British Review* for 1847:

---


\(^6\)Simpson, J. Y.: Answer to the Religious Objections Advanced against the Employment of Anaesthetic Agents in Midwifery and Surgery, Edinburgh, Sutherland & Knox, 1847.
It is useful to remind those who surrender themselves unreservedly to experiments of this nature that the vapor of ether, when combined with air, constitutes an explosive gaseous mixture of the most dangerous kind. Now, if it be considered that the vapor-laden air inspired by a patient about to be operated upon is precisely this explosive mixture... an idea may be formed of the fate that awaits the patient if fire should unhappily reach the air which he is inhaling.\(^7\)

The reactions of the medical practitioners divided them into three groups: (1) those who considered the dangers so inconsiderable as to justify the use of anesthesia prior to all operations; (2) those who wished to limit the use of anesthesia to severe operations and to discourage its general employment; and (3) those who objected altogether to the use of anesthesia as dangerous and harmful in its tendency.\(^8\)

The country practitioners were cautious in the use of either agent, and it was not till the early fifties that anesthesia was in general use. The general distrust of the public and the sharp criticisms of charlatans and fogies in the profession made the practitioner cautious.\(^9\)

As late as April 13, 1852, H. S. Patterson declared to the Philadelphia County Medical Society: “Our hospital—alone among great hospitals—has never permitted their [anesthetics] employment.”\(^10\)

The reasons for this diversity of opinion were several and affected the preference of some for ether and of others for chloroform. In the first place:

the anesthetic, sulphuric ether, was, with some few exceptions, put into very general requisition, not only by surgeons, in almost all operations, great and small, but by dentists, to some extent, by accoucheurs, and even by the unprofessional, in some cases to allay pain, in others merely to procure the pleasure of an agreeable and speedy intoxication.\(^11\)

The same was true of chloroform:

So pleasant, and at the same time so powerful are the exhilarating and anodyne effects of chloroform, that the day is probably not distant when it will not only be used by every physician, but be “hung on some rusty nail” by the side of paregoric and Godfrey’s cordial in every place

---

\(^7\)Nevius, L. W.: The Discovery of Modern Anaesthesia, New York, George W. Nevius, 1894, p. 102.

\(^8\)Anaesthetic agents, Tr. A.M.A. 1:176, 1848.


\(^10\)Nevius, L. W.: op. cit., p. 103.

and every log cabin in the land, and that for one dose of either of the latter articles a hundred delightful sniffs will be taken from the former. If a little child has a belly ache or an old woman a face ache, a few pleasant whiffs from the green bottle will dissipate it all.\textsuperscript{12}

In addition, the administrators of chloroform and ether knew practically nothing about the physiologic effects of the agents, they were untrained and they displayed less sense than enthusiasm in devising methods for getting the vapor into the patients’ lungs. Such free, wide and injudicious application of two potentially lethal drugs could have but one result—anesthetic deaths.

In 1849 the Augusta [Georgia] group had reported a series of sixty-four operations done under anesthetic agents. Of this number fifty-eight were done under chloroform alone although ether was used in the others. The reason for this indifference to ether seems to depend upon certain peculiar features. Apparently the indiscriminate use of ether by the population at large who employed it in the capacity of a drug placed the substance in a rather anomalous position in the eyes of the profession. Further the controversy about priority concerning the use of ether placed the substance in professional disfavor. . . . Another factor in the lack of popularity of ether was the generally unsatisfactory results which it gave at that time when administered by the method commonly employed. Some surgeons complained of the lack of depth of the anesthetic effect but still more important reasons for its lack of use lay in the anesthetic deaths resulting from it. Some of these were especially embarrassing and, in the case of the death of one of the medical students at the medical college, caused considerable unfavorable comment. Indeed one wonders, in reading the reports of some of these deaths, if the substances used could really have always been pure ether. It is not to be wondered at if the medical men of the period in Georgia generally found in chloroform a more suitable agent than ether about which so much strong emotional behavior was manifest.\textsuperscript{13}

[November 21, 1852. Action] was taken on an occasion the occurrence of which was the cause of painful interest within the walls of the Hospital and to the community outside of it. At the meeting of the Board on Nov. 7, the case of James Clancey, who had died on that day in the [Massachusetts General] Hospital, had been referred for full investigation and report to a special Committee. . . . It appeared from the report, after a most thorough investigation, that by a mistake which had occurred, without, however, involving any culpable neglect on the part of the Hospital Apothecary, the Surgeons accidentally administered


chloroform for the usual preparation of chloric ether, to three subjects of operations. The third of these patients, James Clancey, whose arm had been amputated, after the use of the anaesthetic, sank into a state of insensibility, from which he was recovered only to die in a few hours afterwards; and also, that when he was apparently in a dying condition, one of the Surgeons "accidentally poured into his mouth a quantity of undiluted caustic ammonia."\(^{14}\)

On the Continent deaths from ether anesthesia led to the imposing of certain legal bans in 1847. The Council of Health of Zurich prohibited the use of ether anesthesia by "those who practice dentistry, bleeding, and other minor surgical operations . . . in consequence of certain accidents having arisen from the use of ether vapour by inexperienced persons."\(^{15}\) Also, the Grand Duke of Hesse-Darmstadt "issued an order forbidding the use of the vapour of ether in operations by the lower grade of medical practitioners (Officiers de Santé), Dentists, and Midwives."\(^{16}\) In England the number of deaths that "could be positively assigned to the inhalation of chloroform" had reached such a formidable total by 1863 that the following year the Royal Medical and Chirurgical Society appointed a special committee of investigation.\(^{17}\)

Fixed ideas with respect to the choice of method as well as agent could account for many of the so-called anesthetic accidents. In the United States simple methods of administration were used from the beginning. Within a few months, at the Massachusetts General Hospital, Morton's inhaling apparatus was abandoned in favor of a small bell-shaped sponge, which was saturated and applied directly over the nose and the mouth of the patient. An improvement on this method, which was soon devised and utilized widely throughout the country, consisted of improvising a cone from a folded towel or sheet of paper and placing the sponge in its apex. Also, in Scotland and for the most part on the Continent preferred methods were simple, and, from the outset, Simpson administered chloroform by diffusing it upon the interior of a hollow sponge or pocket handkerchief or piece of linen or paper, which was held over the mouth and the nostrils.

---

\(^{14}\)Bowditch, N. I.: A History of the Massachusetts General Hospital, 1810-1851; with a Continuation, 1851-1852, by George E. Ellis, Boston, Bowditch Fund, 1872, p. 474.

\(^{15}\)London M. Gaz. 4:525, 1847.

\(^{16}\)ibid. 5:85, 1847.

To achieve the desired results with the relatively safer but less potent agent ether, in comparison with chloroform, massive quantities of the drug were used. In 1873, C. S. Tomes, an English dentist, visited the Massachusetts General Hospital and, on his return home, described the anesthesia procedure in the *British Medical Journal*:

The patients are etherised in small anterooms adjoining the operating theatre, the ether being administered by one of the junior house officers, who is, in nine cases out of ten, not yet qualified. Two or three ounces of pure anhydrous ether are poured upon a conical sponge, which has been previously moistened with water; this is at once placed over the patient's mouth and nose. If he struggle, which he generally does, . . . he is held down by main force till he succumbs to its influence. Ether is lavishly poured upon the sponge, so that it often runs down upon the patient's face and neck, and half a pound is not rarely used for a single administration.\(^8\)

In England, where inhalers were extremely popular, ether anesthesia met with little success:

But, owing to various shortcomings in the inhalers at first used—particularly a tendency to freeze up and to offer resistance to breathing—and to the diffidence and hesitancy with which inexperienced administrators applied even the most dilute ether vapour, the patient was often so lightly anaesthetized that surgical stimuli provoked responses which sometimes culminated in uncontrollable excitement. Even when the patient remained tranquil he was seldom sufficiently deeply anaesthetized for his muscles to be completely relaxed.\(^1\)

Three distinct factors may account for this deep-rooted Victorian preference for inhalers. First, there was the Englishman's natural bent for mechanical invention and the trust which, whether as administrator or patient, he placed in the use of apparatus as a sure means of reducing human error. There was also the importance which he attached to personal comfort, so that even as a preliminary to a surgical operation he no doubt found reassurance in breathing the anaesthetic from an inhaler made by some reputable firm from good glass and plated metal and having a facepiece, plush-lined or with a padded rubber rim, to fit his cheeks snugly. Whether or not the apparatus had been thoroughly cleansed even of the grosser soiling of previous use does not appear to have troubled him greatly.\(^2\)

... The very facts that apparatuses were far from perfect and that as a result of chloroform anaesthesia patients were liable unpredictably to die, acted as a constant stimulus to English anaesthetists.\(^3\)

\(^1\)Tomes, C. S.: The administration of ether in America, Brit. M. J. 1:297, 1873.


\(^3\)Ibid., pp. 24-25.
The greater potency of chloroform, its speedier action and easier applicability by means of an inhaler or from a cloth led it to be looked upon favorably, not only by the English, but by practitioners generally, until the mounting mortality served to discredit it, although not sufficiently to produce a noticeable reduction in its use. This was true despite the greater safety of ether.

But, very soon, a death occurred from chloroform, then another and another in quick succession. This led to its more careful and restricted use by some surgeons, to its total abandonment by others, but the general mass of surgeons and physicians still continued its use, with more regard, however, to its now admitted dangers, and of course, with more caution in its administration; while the public generally took the hint, and were not so ready to demand anesthesia of the surgeon and dentist for every trivial pain or operation . . . so that there is, at this time [1855], an evidently growing distrust of the agent, both in and out of the medical profession, which may soon threaten to banish this “great boon to humanity” from surgery altogether. . . . [It] appears that chloroform is still the agent most exclusively employed by the general mass of the profession, especially in private practice.22

The problem that the various methods of administering inhalation anesthetic agents tried to solve was simply that of providing sufficient amounts of the drug to produce the desired state of unconsciousness and relaxation while admitting enough air (oxygen) to prevent the patient from being asphyxiated fatally. Fundamentally, this is the problem of inhalation anesthesia today, although the nonmechanical methods of administering volatile anesthetics (ether, chloroform, divinyl ether) have been improved greatly over the old suffocation technic with the cone, and the modern gas machine, with its wide array of agents (oxygen, nitrous oxide, cyclopropane, ethylene, ether) and carbon dioxide absorber, approximates a precision instrument. It is not far short of the facts to state that lasting innovations in the closed, or machine, method of administering inhalation anesthesia may be counted on the fingers of one hand, many of them depending upon commercial rather than professional developments: the combination of gases and volatile agents rather than the exclusive use of one; the combination of oxygen with the inhalation agent; the use of the carbon dioxide absorber to permit a completely closed breathing circuit; the purification and the standardization of gases; and the compression, or liquefaction, of

22Lente, F. D.: loc. cit.
gases for easy handling with the corollary development of reducing valves.

In 1848 Thomas Nunneley described the anesthetizing qualities of a mixture of ether and an alcoholic solution of chloroform. In May, 1848, John Gabb suggested that it might "be desirable to add a little of the stimulating effect of the ether to the directly sedative influence of the chloroform." In 1871 Joseph Thomas Clover (1825-1882) stated that he "had been in the habit of giving nitrous oxide first, and then ether, as the great difficulty was to get patients to inhale it freely."

In 1868 Edmund Andrews (1824-1904), an American surgeon, advocated the administration of oxygen with nitrous oxide.

In 1869 Alfred Coleman, an English dentist, was the first to use clinically a carbon dioxide absorber in anesthesia. In his absorber expired gas was passed over slaked lime. John Snow (1813-1858) had used previously a similar device while experimenting on himself with chloroform and ether, the absorbing agent being caustic potash. Antoine-Laurent Lavoisier (1743-1794) and Seguin had used carbon dioxide absorbers to keep animals alive in closed vessels during experiments on respiration.

In 1868 the English firm of Barth compressed nitrous oxide into cylinders, although not sufficiently to liquefy the gas. By 1870 both Barth and Coxeter & Son succeeded in producing liquid nitrous oxide. In 1871 in the United States, the Johnson Brothers compressed nitrous oxide into wrought iron cylinders.

However, the central problem, that of delivering calibrated ratios of inhalation anesthetic agents and oxygen to the patient to provide by mechanical means a desired state of anesthesia, is still to be solved.

On the other hand, it is as true today as ever that the successful

22 Keys, Thomas E.: The History of Surgical Anesthesia, New York, Schuman, 1945, p. 49.
28Snow, John: On narcotism by the inhalation of vapours, London M. Gaz. 11:749, 1850.
29Duncum, Barbara M.: op. cit., p. 60.
31Keys, Thomas E.: op. cit., p. 108.
administration of anesthesia by mechanical as well as nonmechanical means depends primarily on the administrator's skill and scientific judgment rather than on the method chosen. The lack of consideration given to this all-important factor in the early application of anesthesia to dull the pain of surgical operations is astonishing, except when viewed in the light of the low position of medical and surgical practice during the greater part of the nineteenth century. Then, it becomes all too clear that the opportunity anesthesia gave the surgeon to operate and the man of inventiveness to profit overrode the more humane considerations of the patient's comfort and well-being. That anesthesia, however miserably applied and fatal its consequences, permitted operations to be performed without the brutality of cutting into a conscious person, aware of the degrading shambles of the operating theater, doubtless excused the narrow self-interest of the administrators.

Since anesthesia is only a means to the end of surgery, the role of the anesthetizer has traditionally been a subservient one. While surgeons who were forced to operate unassisted in isolated communities administered the drugs themselves, or called on a bystander or a member of the family to act as anesthetist, in hospital practice the job fell to the assisting surgeon or, more generally, to a raw and untrained medical student, intern or house officer.

Reporting on his discussion of ether anesthesia at the International Ophthalmological Congress in London, August 1-3, 1872, Benjamin Joy Jefferies (1833-1915), on his return to America, said:

As to the relative disagreeabilities of ether and chloroform I frankly told them I was not in position to judge, for I had never administered the latter and was not an etherist; in fact, we had, and needed none among us, since surgeons in America gave ether themselves when operating, or it was exhibited by a surgeon assisting, or by a medical student.32

Two quotations describe the situation in France. In 1890 Albert Dastre (1844-1917) wrote:

For some years past, surgeons have tended to relieve themselves of the anxious business of personally superintending the administration of chloroform; they leave this task to an assistant, always the same one, who through constant practice, finally acquires a considerable degree of reliability.33

---

According to Félix-Jean-Casimer Guyon (1831-1920):

We have said nothing about the practice adopted by some surgeons to trust the administration of gases to a special aide, always the same, often foreign to the medical art and who accompanies them in all their operations. This custom enough in favor in England has been adopted at Strasbourg by M. Sédillot and several other of the distinguished surgeons of that city; but it has not prevailed at Paris in spite of the very real advantages that it can offer. It is necessary, in our opinion, to require that the professional chloroformist be a physician.\(^{34}\)

Of the practice in Vienna, Christian Albert Theodor Billroth (1829-1894) wrote:

It is unavoidable, that in a clinic such as here in Vienna among 8 assistants and 2 house surgeons the very uninteresting work of chloroforming must be taken in turn. Whoever gives the chloroform often sees little or nothing of the operation; I cannot very well condemn one of my assistants to this post for a whole semester. However, by setting up a system of rotation, so that each assistant anesthetizes one month after another, I can by this frequent changing absolutely rely upon whoever anesthetizes.\(^{35}\)

The custom in Scotland was described by Joseph Lister (1827-1912):

And it is worthy of special notice, as showing that success is due to soundness of the principles acted on, rather than any particular skill, that the giving of chloroform, instead of being restricted to a medical man appointed for the function, as is elsewhere often thought essential, is entrusted to the junior officers of the hospital [Edinburgh Hospital and Glasgow Infirmary]. In Edinburgh each of the five surgeons has two “clerks”, intermediate in position between the house surgeon and the dressers. They, besides other duties, take it in turn to administer the anaesthetic; and if I had to be placed under its influence I would rather trust myself to one of these young gentlemen than to the great majority of “qualified practitioners.”\(^{36}\)

In England, particularly, some few physicians made anesthesia an important part of, if not exclusively, their business and gained appointments to hospitals as honorary “chloroformists.” Of no little significance in the early development of surgical anesthesia was the fact that it provided both regular and irregular practitioners

\(^{34}\)Guyon, F.: Elémentes de chirurgie clinique, Paris, Baillière, 1873, p. 172.
\(^{35}\)Billroth, Th.: Chirurgische Klinik Wien 1869-70, Berlin, August Hirschwald, 1872, p. 36.
with a new way of making a living. Moreover, the patenting and the manufacturing of inhalers, primarily in England, afforded a new source of income for practitioners and instrument makers alike. An example of the way in which the professional physician anesthetizer came into being is provided by the following story about John Snow, the London physician who is believed to have been the first specialist anesthetist:

One day, on coming out of one of the hospitals . . . , [Dr. Snow] met Mr.—(a druggist whom he knew) bustling along with a large ether apparatus under his arm. “Good morning!” said Dr. Snow. “Good morning to you, doctor!” said the friend; “but don’t detain me, I am giving ether here and there and everywhere, and am getting quite into an ether practice.” . . . An “ether practice! If he can get an ether practice, perchance some scraps of the same thing might fall to a scientific unfortunate.” Consequently, with his improved inhaler, Dr. Snow lost no time in asking to be allowed to give ether at St. George’s Hospital.37

According to Raginsky:

Psychologically the course and direction of progress in anesthesia has not been altogether accidental. Early in its development, men had taken it up as a specialty often because they consciously or unconsciously did not want to be bothered with the patient-physician relationship. Some entered the specialty because they could not tolerate the resistances and antagonisms of patients and preferred a specialty which allowed them to get rid of some of their own hostility (repressed) by “slapping” on a face mask and putting their patients to sleep and consequently into a more submissive role. Some became anesthetists because they thought that since even a nurse or intern could administer an anesthetic it should be one of the easiest of specialties to master. The dramatic results of anesthesia appealed to others, while still others specialized in it because they found themselves to be too passive for ordinary practice and preferred to work under the direction of the more aggressive surgeons. That they did not become surgeons instead of anesthetists might be due in part to the lack of aggressiveness and displaced sadism in their make-up, qualities seen more often in surgeons.38

Other reasons for the gravitation of practitioners to the calling of anesthetist are illustrated by the cases of J. T. Clover, who suffered from general ill health, and Frederic William Hewitt (1857-1916),

37Snow, John: On Chloroform and Other Anaesthetics; Their Action and Administration; with a Memoir of the Author by Benjamin W. Richardson, M.D., London, Churchill, 1858, p. xiv.
whose eyesight was very poor. The career of anesthetist was adopted because it promised to be less arduous than the originally chosen careers of surgeon and physician.\textsuperscript{39}

An indication of the motley group that undertook to administer anesthesia is to be found in the cases of deaths from chloroform reported by Snow in 1858. While, in the majority of the fatalities, so-called regular medical practitioners administered the anesthetic, the following cases are illustrative of the fact that anesthesia could be anybody's business: Case 2. “The next recorded case in which the inhalation of chloroform was fatal, occurred at Cincinnati, on the 23rd of February, 1848. . . , [The] chloroform, . . . was administered by two dentists, who were not members of the medical profession.” Case 9. January 24, 1849. Hôtel Dieu, Lyons. “It was administered by two assistants who were accustomed to its use, and who at the time attended the pulse.” Case 12. October 10, 1849. “The chloroform in this case was administered by a non-medical person—a sort of surgery-man. After this accident, however, the chloroform at St. Thomas’s Hospital [London] was always entrusted to some one belonging to the profession.” Case 14. Berlin. “The dentist who administered it was not a medical man.” Case 18. Glasgow, March, 1850. “I now told my clerk to take charge of the chloroform.’’ Case 25. March 17, 1852. St. Bartholomew’s Hospital, London. “It was administered by one of Mr. Lloyd’s dressers, who well understood, and had great experience in its use.” Case 41. July 13, 1854. Middlesex Hospital. “‘Chloroform was administered by Mr. Sibley, the registrar to the hospital.’” Case 45. “On September 8th, 1855, a lady, aged twenty-nine, the wife of a physician, died suddenly whilst inhaling chloroform for the relief of facial neuralgia.” On one occasion, Snow further said, according to Richardson: “at some of our hospitals, the administration of chloroform has been entrusted to the porter.”\textsuperscript{40}

In the light of all the factors that conspired against a different general evaluation of the importance of anesthesia, particularly its intelligent humane application—the low state of medical education and practice, the degraded condition of hospitals, the lack of public faith and the high mortality from surgical infection—it is evident that progress in other directions had to be made before attention would be paid to outcries against the abuses.

\textsuperscript{39}Duncum, Barbara M.: op. cit., p. 532.

\textsuperscript{40}Snow, John: op. cit., p. 127 ff., p. xxviii.