A respectable  there, nothing particular to say about it.

On Anaesthesia and Anaesthetic Agents

by

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There exists in man, from his peculiar organization, an innate feeling of sympathy for suffering, and with this an earnest desire to alleviate it, so far as in him lies. Bacon embodied this idea in his conception of the Physician's duty "not only to restore health but to mitigate pain and doulours," such feeling was, no doubt, the first cause of the study of Medicine, and still is the powerful motive which leads to its cultivation. Witness the labours of the Fathers of Medicine. Behold again the mighty efforts, the ceaseless toil of the Alchemists, in their unwearyed search for that splendid delusion—the universal Medicine. Such was the feeling which also inspired the Philan-thropic Howard to undertake his world-renowned journey, and stimulated him to proceed amid dangers that cause a shudder by the mere recital, and to visit scenes of wretchedness, such as few men could witness unmoved. The impulse of this feeling too, by giving direction
to the researches of powerful and rapacious minds that per-
feeted that world's wonder and
glorious boon to suffering humanity
- Anaesthesia, the subject of the
following pages.
I propose then, to give a short sketch
of the history of Anaesthesia, and
then consider carefully the two
agents which have been chiefly
employed to produce that
state, namely, Sulphuric Ether
and Chloroform.

History of Anaesthesia.
Attempts to produce immunity
from pain during surgical operations by
means of medicinal substances, were
made at a very early period, and
at a time when the noble science of
Medicine was but in its infancy.
Dioscorides mentions traditionally
that the Memphisian stone was used
for this purpose, and was applied to
parts that were to be cut or cauterized.
In the works of several of the ancient authors we also read of Mandragoras having been employed nearly two thousand years ago for a similar purpose. (Dioscorides Opera Lib. IV Cap. 76) — οἷον δὲ καθερέων ὄντος τὰς ρίζας ἀρχιτικῶν καὶ διδασάντως ἀποτίθενται ἐφορμένοι ἐπὶ τῶν ἄργχενων καὶ περισώνυμων πώλημα ἐν ἐν' ἐφ' ἐν ροδών ἀνασθούσιν τεμπορέων ἐν καιρῷν πώλησιν.

Ambrose Pare also mentions the anaesthetic properties of this drug. "Mandragora taken in great quantity, either the root or fruit causeth great sleeping, sadness, resolution and languishing of the body, so that after many scartches and gripings the patient falls asleep in the same posture as he was in, just as if he were in a lethargy, wherefore in times past they gave mandragore to such as were to be disembred." (Ambrose Pare's Works Book 21 Chap. 35. By Johnson.)
The use of this plant, however, must have been very limited, or its effect inefficient, or its employment would certainly have been more universal and not confined to that early period. For many centuries after, we have no account of any anaesthetic being employed, until about the year 1300, when we have a receipt published by Theodoric, for a preparation of various narcotic plants, the vapour of which when inhaled, it said to have produced insensibility sufficiently profound for the performance of operations on patients thus narcotised. That such a preparation could have this effect is doubtful, however in 1832, Dr. Dauriot found a very similar preparation to very efficacious, & it appears to have performed several operations successfully upon patients while under its influence. His receipt is as follows:

At midsummer, when vegetation is at its height, Solanum nigrum, hyoscyamus
nier, cicuta minor, datura stramonium, lactuca ptero, are gathered, and sponge is plunged in their juice freshly expressed. The sponge is then dried in the sun, the process of dripping and drying is repeated two or three times, and the sponge is then laid up in a dry place. When the sponge is required for use, it is soaked for a short time in hot water; afterwards it is placed under the nose of the person to be operated upon, who is quickly plunged into sleep more or less deep, according to the susceptibility of his nervous system. The possibility of producing narcotism by this preparation can hardly be questioned, yet when we consider the ingredients of it, we should certainly be bold indeed, to sanction its universal application for the production of insensibility sufficiently deep for the painless performance of operations. However the anaesthetic attempts of the Ancients, the
narcotic vapours of Theodore, and Dr. Dauriel's revival of the "Pongia somnifera" would certainly have been consigned to oblivion, had not the anaesthetic applicability of ether been discovered, a discovery almost unparalleled in the History of Medicine.

The merit of this glorious boon has been keenly claimed by many aspirants, and it was at one time difficult to place the laurels on the deserving brow.

Towards the end of the last century when Priestley, Black and Cavendish by their great and magnificent discoveries in "Pneumatic Chemistry" as it was then called, had given such a stimulus to the study of this novel branch, as led Sir H. Davy to undertake with reckless zeal his perilous investigations on the properties of the gases and caused him to prosecute his laborious researches quite heedless of the danger, he so
frequently incurred. And, although in his investigations, he made some of the most brilliant discoveries, and produced one, which, of itself is sufficient to immortalise his name—I allude to the safety lamp;—as a means of prevention of those frightful explosions from inflammable gases which were then of fearful frequency in Coal Mines &c., yet the splendid discovery of Anaesthesia escaped him. In his experiments with the Nitrous Oxide, he appears to have overlooked the analogous properties of the vapour of Sulphuric Ether. For had this great philosopher subjected this agent to his exact and careful experiments, there is reason to believe that the discovery would have certainly originated with him, as he had the idea of the possibility of applying nitrous oxide for the alleviation of pain in operations. In mentioning the
the inferences he had drawn from his experiments with this gas, he says "As nitrous oxide in its extensive operation, appears capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place." And in another passage of the same work he says: "Pneumatic Chemistry, in its application to medicine, is an art in infancy, weak almost useless, but apparently possessed of capabilities of improvement.

The peculiar property of the vapour of Ether in producing, when inhaled, a state of exhilaration very analogous to the effect of nitrous oxide, has been known for some years. In the Journal of Sciences & the Arts we find the following notice of the effect of the inhalation of Ether vapour, I am unaware of the writer's name, the passage occurs under the head of Miscellanea.
in the Fourth Volume of that work and at page 158. It is as follows. "When the vapour of ether, mixed with common air, is inhaled, it produces effects very similar to those occasioned by nitrous oxide. A convenient mode of ascertaining the effect is obtained by introducing a tube into the upper part of a bottle containing ether, and breathing through it; a stimulating effect is at first perceived at the epiglottis, but soon becomes very much diminished; a sensation of fulness is then generally felt in the head, and a succession of effects similar to those produced by nitrous oxide. . . . It is necessary to use caution in making these experiments of this kind. By the imprudent inspiration of ether, a gentleman was thrown into a very lethargic state, which continued with occasional periods of intermission for more than thirty hours, and a great depression of spirits; for many days the pulse was so much lowered.
that considerable fears were entertained for his life." It certainly does appear somewhat strange that we should have remained so long in ignorance of the anaesthetic properties of that substance in operations, more especially as the inhalation of ether vapour was frequently made the means of amusing students, and relieving the too often dull and tedious details of chemical lectures in America and elsewhere. But although the discovery had obscurely flashed across the minds of many, still it was left for Dr. Morton and Jackson to perfect it; they both claimed the honour but were willing to share it.

In the "Comptes Rendus de l'Academie des Sciences" for March 1847, page 74, there is a letter to M. Elie de Beaumont dated Boston, Dec. 13th, 1846, in which Mr. Jackson asked permission to communicate to the "Academie des Sciences" a discovery which he had made "five or six years" previously, of a particular state of
sensibility produced by the inhalation of the vapour of pure Sulphuric Ether, he there communicates several experiments which he had made, and operations performed under its influence. Notwithstanding this positive assertion, I believe the honour is mainly due to Dr. Morton, who being impressed with the idea of Anaesthesia, was led to perform several experiments with various agents and at length was rewarded by actually discovering the applicability of Ether in surgical operations, while Jackson has the merit of suggesting Ether for Morton's experiments.

After the discovery was published there was no lack of aspirants, who proudly came forward to prove the priority of their discovery, and brought forward numerous proofs in the form of vague and detached sentences in support of their claims. But, it would be needless and unprofitable to discuss these. We cannot however summarily
diminsh the claim of Mr. Thace Wells who certainly did make a very near approach to the discovery, and he states that he had administered nitrous oxide gas and the vapour of ether to about fifty patients since the year 1844. In these experiments, Mr. Wells was doubtless acting upon a wrong principle, as he gave his mixture not as an anaesthetic, but merely with the view of producing so much excitement that the mind of the patient should not be sensible of the operation, and this effect, he certainly did not ascribe to ether but to nitrous oxide; although he was on the right track, however near he was to the discovery, still it cannot be denied that Dr. Morton actually discovered that the vapour of ether could produce anaesthesia "sufficient for the painless performance of operations." From what source Morton first obtained the idea of anaesthesia
we know not, yet all must admire the indefatigable daring and perseverance with which he prosecuted his somewhat dangerous experiments. We are told that on one occasion he very nearly lost his life, as it was his practice in testing numerous agents always to make his experiments first upon himself. In this way was anaesthesia discovered. Dr. Morton, having informed Dr. Jackson of his experimental enquiry, the latter, in answer observed that he had been, in his college days sulphuric Ether produced insensibility, and it thereon might answer his purpose. Taking advantage of this hint Morton immediately commenced the inhalation of Ether, and was delighted to observe that after inhaling it for some seconds, approaching insensibility was felt, and that he had actually been unconscious for several minutes. As soon as he was able to leave the
room in which he had formerly made
the experiment, he was anxious to
try the ether upon a patient. His wish
was accomplished, a patient soon
presented himself to have a tooth ex-
tracted, the tooth ether was inhaled
the tooth removed and yet the
patient declared that he had
been unconscious of pain. Other
operations quickly followed, and
the first public trial of its efficacy
was made in the Massachusetts
Hospital on Nov. 7th 1846, when
Dr. Hayward amputated the
thigh of a young girl, rendered
insensible by the inhalation.
Dr. Morton superintended the
operation which proved perfectly
successful.

Let us now consider briefly the
Therapeutic actions of this subtle
fluid, which can produce such wonder-
ful effects, and which would
have been such a boon to suffering humanity
had it not been superseded by Dr. Simpson's discovery of the more safe and more generally applicable anaesthetic Chloroform.

**Sulphuric Ether**

This fluid was known as early as the fourteenth century, and was first accurately described as a medicinal agent by Valerius Cordus in 1540, under the name of "Venum petrolei Aureum". The term Ether was applied to it 130 years afterwards, by Prolinius, who, in a paper in the Philosophical Transactions, published an account of its properties.

It is obtained most easily by the action of concentrated sulphuric acid upon rectified spirit. In order to obtain it pure, minute attention is requisite to the details of the process for its preparation, which are given in most of our best works on Materia Medica.

Sulphuric Ether when pure is of a colourless, transparent and very mobile fluid, of a peculiar powerful penetrating odour,
and of a pungent, cooling aromatic taste. It is extremely volatile, and produced by its evaporation intense cold. It is very inflammable and its vapour is apt to cause dangerous explosions, even when mixed with air, therefore care is necessary in its use, not to approach it with a light. Its density has been variously stated between 710 and 720 at 60° F. Its elementary constitution is C_5_2H_2O, and these elements are conceived to be variously united as to form a hydrate of etherine C_5_2H_4+H_2O, or a hydrate of olefiant gas 2C_2H_2+H_2O, or a compound of the imaginary compound radical Etheric C_5_2H_5+O. Dr. Chirstian entertains the first of these views, although perhaps the last is now most generally received.

Sulphuric Ether is used in Medicine as a narcotic, stimulant, antispasmodic refrigerant and carminative, and in Chemistry as a solvent of fats, fat oils, essential oils, resins, some acids, and bases.
It is somewhat soluble in water, which dissolves about one ninth of it. It mixes in all proportions with alcohol, and dissolves sulphur, iodine &c.

Therapeutic Actions of Sulphuric Ether.

1. As a Narcotic. Ether is scarcely ever used as a narcotic, and this action is seldom observed, unless it is taken in very large doses. In its "modus operandi" it very closely resembles alcohol, only its effects are much more rapid and transient. When taken in great quantity it is a narcotic of considerable power, and produces its first effects upon the brain as an excitant; then this excitement is succeeded by great depression, and it ultimately causes suspension of sensation and voluntary motion, and if antidotes are not employed, death itself quickly closes the scene. Asila found that half an ounce of Sulphuric Ether, on being introduced into the stomach of a dog & retained there by ligature, occasioned death in three hours. (Eide Christian's Work on Poisons.)
2. As a stimulant. This is the action, which chiefly renders ether valuable as a medicinal agent, and it is most beneficial in spasmodic and painful affections, when unattended with vascular excitement. In spasmodic asthma it generally relieved the paroxysm, although it does not prevent its recurrence. It almost always cuts short the attack of angina pectoris, and during the passage of a biliary calculus it is given with most decided benefit to relieve the spasm of the ducts through which the calculus is passing. Its stimulant and antispasmodic action has also sometimes been found very serviceable in the latter stages of continued fever, to relieve the shivering and subcutaneous tendinitis. It is a favorite popular remedy in faintness, palpitation, and nervous headache. I have used it with great benefit in the convulsions of children, even after other means had failed, but care is necessary in such cases, lest conjugation be present.
3. As a Carminative - it is a powerful agent in the treatment of Gastralgia, Sinfulis and Flatulent colic. This action is explained in the following manner by Dr. Christian (vide Dispensatory). “When it enters the stomach, it passes to the state of vapour and in so doing so collects the gases diffused through the contents of that organ.”

4. As a Refrigerant. From its property of producing intense cold by its evaporation, Ether is sometimes employed locally to remove headache and external inflammations. It has been used in this way in cases of strangulated hernia, as the bulk of the part is diminished by the intense cold; it consequently, the reduction of the hernia is facilitated. It is used, but with questionable utility in Burns and Scalds.

5. As an Anaesthetic. Since the introduction of Chloroform in Medicine, the employment of Ether has been almost totally abandoned as an anaesthetic. But as it was the discovery
of this property of Ether, which led to the investigations in Anaesthetics, which were crowned with such success, and which have proved of such immense value to mankind, it will be proper to describe this action here, although its "modus operandi" will be more conveniently considered under the head of Chloroform.

When the vapour of Sulphuric Ether is inhaled, there is at first some slight irritation experienced in the larynx, along with a sensation of warmth in the chest, which sometimes occasions cough. It requires the vapour to be much diluted with air, after several inspirations the pulse and breathing become quickened, the face flushed, and more or less mental excitement; but if the inhalation be persevered with, the muscles become relaxed, the breathing deep and stertorous, the eyes turned upwards and fixed, in this state there is the most complete insensibility to external
impressions, but should the inhalation be continued, much beyond this, the reflex action of the spinal cord is interrupted, and perfect coma is produced which in several instances has proved fatal. In most patients the symptoms occur as above described, in others again, there is an entire total insensibility to pain, but still they are conscious of all that is passing around, while in some cases the most delightful sensations are produced even while they are undergoing the most painful operations. The variations in its effect, are not so much due to the temperament of the patient, as to the quantity of the vapour inhaled, for we may generally divide the symptoms produced into three periods. The first that of excitement; the second that of insensibility but partially complete, with consciousness; and the third that of profound insensibility and unconsciousness.
M. Flourens, having produced a state of insensibility in a dog by Ether, exposed the spinal cord in the dorsal region, the animal evincing no sign of pain during this severe operation, the cord, thus exposed, its posterior columns were "pinched and cut," still the animal felt no pain, when the anterior columns were "pinched and cut," not one of the muscles to which the nerves of these columns are distributed were put in motion; the spinal cord itself was then wounded down to cut, without the animal giving the least evidence of suffering or convulsions.

In a second experiment the same general results were obtained, excepting that when the anterior columns were cut, there appeared on each section a slight movement in the animal. In a third experiment the spinal cord was exposed when the exterior parts had become insensible, on cutting the posterior...
columns, there was apparently no suffering, on cutting; however, the corresponding anterior column, the animal gave a slight shudder, the inhalation of the Ether was continued for a few minutes, then the other anterior column was cut and the animal did not give the slightest evidence of pain. From these experiments he deduces that Ether has the astonishing power of annihilating (for a time) the principles of motion and sensation in the spinal cord, and further that the principle of sensation always disappears before the principle of motion.

Having thus glanced at the therapeutic actions of Ether, we may now pass to consider its successor Chloroform, which in a most incredible short space of time, gained such a firm standing as an anaesthetic. There is, however, no article in the Helenae Medica which has ever been so universally used in such a short time.
Chloroform.

This remarkable fluid was discovered nearly at the same time by Soubiran in 1832 and shortly afterwards by Liebig. Its composition and relations to other bodies was first accurately investigated by Dumas. Dr. Mortimer Glover was the first to ascertain its actions on animals in 1842.

It is best prepared by the action of hypochlorite of lime on alcohol. It is a colourless transparent, mobile heavy liquid of the density of very nearly 1.5. It possesses a peculiar fragrant fruitlike odour, and a corresponding ethereal and most intensely saccharine taste. It evaporates very readily and boils at 140°. It is not inflammable itself, but communicates a dull yellow, sooty flame to burning alcohol. It is very soluble in alcohol, but sparingly so in water.
It dissolves volatile oils, compost, eau, chou, sulphur, phosphorus, wax and resins. This Chloroform, Chloroformyl or Perchloride of Formyl, consists, according to Dumas, of three equivalents of chlorine united with two of carbon and one of hydrogen, that is three equivalents of chlorine combined with one of Formyl \((\text{C}_2\text{H}_5\text{Cl}_3 \text{ or } \text{F}_2\text{Cl}_3)\).

Chloroform is often adulterated with Alcohol and certain volatile oily compounds. Alcohol may be easily detected, by the density of the chloroform being low or by its drops becoming opalescent, then dropped into water. From faulty preparation it may even contain traces of Sulphuric Acid, which however is detected easily with litmus paper.

Soubiran, Gault and Gregory have directed their attention to the nature and detection of impurities in Chloroform, and have ascertained that the volatile oily impurities above mentioned, are compounds of chlorine,
and have an intermediate composition between chloroform and one of the
known chlorides of carbon, they have
a disagreeable smell and when inspired cause
distressing headache and sickness.
They are best detected in chloroform, by their
odour, for when pure chloroform is dropped
upon the hand, it evaporates without leaving
any trace, while these impurities are present
they impart to the hand a persistent
peculiar smell, which is readily recognised.

In one specimen which I obtained lately
in Edinburgh from a most respectable
chemist, these oils were so abundant,
that the chloroform occasioned severe
headache and sickness in all who
inhaled it, and the handkerchief which
I had used, retained the peculiar
unpleasant odour for two or three
days. It is probable that many
of the disagreeable effects, ascribed
to chloroform, when it was first
introduced, were mainly due to
these adulterations.
Therapeutic Actions and Uses of Chloroform.

When taken internally in small doses Chloroform acts as a Stimulant, Calmative and Antispasmodic; in large doses it is a narcotic poison of considerable activity. But these effects are observed with greater facility when the vapour of Chloroform is inhaled. When administered in the way of inhalation it is in addition a powerful anaesthetic, anodyne and sedative.

1. As a Stimulant. Although this is the first effect of a dose of Chloroform, whether inhaled or given by the mouth, still it is rarely solicited by the practitioner, it has however been employed as such in certain forms of Dysmenorrhea.

2. As a Calmative and Antispasmodic.

On account of these properties Chloroform is a most valuable remedy and was used as early as 1838. By
Dr. Forby of Liverpool in cases of
Hysteria. In Epiausmodic Asthma
it generally relieves the Paroxysm
it even appears to keep off the
attack. When Asiatic Cholera was
making such ravages among us,
Chloroform was frequently used
with evident success.
I have observed Chloroform check
nervous vomiting, when other better
known and more external remedies
had failed. By some it has been
found serviceable in the vomiting
which occurs in Pregnancy.
I have seen it frequently appear
of great efficacy in flatulent
colic and cramps of the stomach.
Externally, Chloroform has been used
with advantage in Neuralgia, tooth
ache and has even been found useful
in that most painful and untreatable
form of the Disease - Sciatica.
In toothache it is dropped into the hollow
of the tooth or applied externally over the cheek.
As a Narcotic. When taken internally, chloroform certainly acts as a narcotic if the dose be large, it has been used with this intention by Mr. Tyson of the Middlesex Hospital in cases of cancer and other painful affections. The form in which he used this substance was that of "Chloric Ether" which is essentially a solution of Chloroform in Alcohol, at the time Mr. Tyson was employing this agent he no doubt was unaware of the composition of the as Chloroform itself was a very scarce article and scarcely ever been except in the laboratories of the Scientific Chemist. In very large doses it may also prove a Narcotic Poison. A case of suicide occurred lately in the Royal Infirmary, where one of Mr. Eyre's patients destroyed himself by swallowing a large quantity of pure Chloroform, and although in this case the violent effects of the drug were well marked, and death was caused undoubtedly
by the narcotic properties of Chloroform.

The report of the post-mortem is as follows:

Examination, 30 hours after Death. Conformation, muscular; body well developed; rigor mortis considerable; face puffy & livid; great lividity of neck, upper parts of chest, & depending parts of the trunk. On opening the chest, the lungs do not collapse; no fluid in either pleura; pericardium contains a small quantity of dark yellowish serum; right side of heart much distended with loose dark coagula; left side firmly contracted; muscular tissue healthy; valves natural; the great veins of chest and neck turgid with dark fluid blood; muscles of neck uniformly of a deep red colour.

The mucous membrane of the cavity of the mouth healthy. On opening the pharynx, the base of the tongue is found coated with a brownish fur. The mucous
surface of larynx presents a uniformly red and deeply congealed appearance, extending as low down as the commencement of the oesophagus, where it ceases by an abrupt and well-defined line.

The lining membrane of the larynx and trachea is also of a crimson red colour, and is covered with numerous irregular patches of a soft, yellowish purulent exudation which can easily be scraped off with the knife, displaying the submucous tissue, minutely injected, bentricles of the larynx filled with a dirty gray purulent fluid. The bronchi as far as they could be traced, are loaded with the same kind of fluid; and the mucous membrane throughout presents an appearance similar to that of the trachea.

The lungs are crepitant, in every part. On section the appearances observed are identical with those found in the first stage of pneumonia,
oesophagus strictly healthy; stomach contained about half a pint of turbid fluid; mucous membrane of cardiac end discoloured; that of pyloric end minutely injected, otherwise perfectly healthy; no trace of disease in any part of intestinal canal. Other abdominal viscera healthy.

On removing the calvarium, the membranes of the brain are found much congested, and the sinuses rigid with dark fluid blood. Substance of brain congested, but of firm consistence. Ventricles do not contain more than half a drachm of fluid.

The odour of Chloroform could be perceived during the examination of any part of the body.

It may be advanced that this is not a true case of narcotic poisoning from the internal administration of Chloroform, as the man also inhaled a considerable quantity of the vapour. This certainly tends
the case a complicated one, and throws great difficulties in our way, when we attempt to ascertain the exact cause of death. In the report of the post mortem examination, it is stated that no odour of chloroform was perceived in any part of the body, now this is contrary to what we should have expected to have found, and is only to be explained by the length of time which elapsed between his death and his using the drug. But still the state of the brain warrants the supposition that death was occasioned chiefly from the anaesthetic effects of chloroform.

However chloroform is by no means such a powerful anaesthetic when taken into the stomach as we might suppose, judging from its anaesthetic action when inhaled. Mr. Runyon states
that when chloroform was injected into the veins, a very small quantity was sufficient to cause death in animals; in his experiments he found that twenty mims were sufficient to kill a large dog, and the appearances after death did not materially differ from those produced by the inhalation of a poisonous dose.

External Use of Chloroform.

Professor Simpson has ascertained satisfactorily that local anaesthesia may be produced by the application of the vapour to any part. Few people can bear their hand even to be immersed in pure chloroform for any long period, although in some persons who are not so sensitive, local anaesthesia is produced more readily when the part is immersed in the fluid. I have repeated these experiments and with very nearly the same results.
Anaesthetic Action of Chloroform.

When twenty or thirty minutes of pure Chloroform are inhaled from a handkerchief, an intensely sweet taste is felt, in the most favourable cases for its employment this is almost immediately succeeded by a whirring and pulsation in the head, sometimes a change in the apparent colours of objects, next it causes an agreeable thrill throughout the body, almost always accompanied with pleasing ideas, then comes loss of consciousness or a semi-conscious state, in which there is generally considerable excitement, and a tendency to laughter or incoherent talking and boisterous turbulence, in some very excitable patients there is a propensity to weep or boisterous dancing. When this state passes off, which if no one of the drug is administered very speedily does, there is no recollection of anything that occurred while the patient was
so anaesthetised, and even if pain had been inflicted there is no recollection of it. The effect upon the pulse is various, generally either it is rendered fuller and quicker, while in some cases the strength of the pulse is diminished. In some instances the excitement produced by small doses of Chloroform is so very excessive, that numerous strong assistants are required to restrain the patient; in one case the invariable result of a small dose of Chloroform is to cause the most immoderate fits of laughter and if the inhalation is continued beyond this, the most violent convulsive movements are occasioned, so that I am always glad to withdraw the handkerchief to prevent him injuring those holding him, the gentleman upon whom these effects are observed is a a test-taker of a very excitable tempera...
He states that the effects of the
Chloroform do not immediately take
off, but even after the lapse of
many hours, he feels a tendency to
convulsive movements which require
a strong effort of the will to restrain.

This is a case in which I believe
convulsions would be apt to
follow the state of deep anaesthesia.
When Chloroform is inhaled in
somewhat larger doses, its most
frequent effect is to produce
a state of coma, with complete
relaxation of the muscles, slow
and generally stertorous breathing.
In this state there is the most
complete insensibility to pain.
This state soon passes off and
seldom lasts longer than ten or
twenty minutes, sometimes it is
succeeded by quiet and refreshing
deepp. If the Chloroform be good, there
is almost never any unpleasant
subsequent effects, occasionally however.
there is slight sickness, which is much more liable to occur if the
patient has lately had a full
meal. The unpleasant results which
have so frequently been observed in
London and elsewhere, are generally
to be ascribed to impurity of the
Chloroform and want of care in
its administration. No inhalers
of any kind should be employed
in its administration, as the
handkerchief
as originally recommended by Dr. Anrep
is far superior to any such contrivance.
As a general rule it should never
be given to patients labouring under
disease of the heart, and it scarcely
can be administered to to patients while
in the sitting posture.
Is Chloroform contraindicated by Spilkeef?
This question is still hotly discussed although
for my own part, I cannot understand
why it should be discussed, as the
very nature of the complaint
should forbid its use, and indeed
cases are recorded where unfavourable results have been observed to follow its use.

Dr. Snow states that persons subject to epilepsy are liable to have a fit brought on by inhaling ether or chloroform. Professor Schlosberger of Tubinghen relates a case in which the fits recurred more frequently than formerly, after the induction of anaesthesia in an epileptic for some slight operation. Some go so far as to say that the fits may be brought on at will by the application of chloroform in patients liable to that disease. As a general rule then it may be stated that chloroform or ether are unsafe in patients affected with disease of the head or chest, and that it is safer always to administer it to patients in the recumbent posture, and no apparatus is necessary, as it is more easy to regulate the quantity of the vapour to be used according to its effects, by the use of the common hand-hering as first recommended by Dr. Simpson.
And with these restrictions, it may be used with advantage in all surgical operations, except those performed on parts within the mouth, and perhaps as Mr. Symes justly observes, it is better to dispense with its use in the operation of lithotritry, as the bladder may be injured by the instrument itself. The patient will be unable to communicate his sensations.

Chloroform in Midwifery.

Many who countenance its use in surgery deprecate its employment in Midwifery, while some with blind ignorance, attribute to it effects which it could not possibly produce. I may mention one effect ascribed to it, "laceration of the perineum!" This is too absurd to merit repetition. But what such a distinguished member of the profession as Dr. Ramsbotham so strongly condemns its use, it is necessary to consider his objections.

It was with no small feeling of
surprise and regret, that I read Dr. Ramsbotham's chapter on "Anæsthesia in Labour," in which he potently opposes its employment, and appears to have hunted up all that had been written against it, without having much experience himself in its use, to warrant his objections. In one place he says, "I unhesitatingly declare my conviction that the treatment is fraught with extreme danger; and that it will be at no very distant time, unless, perhaps, in some exceptional cases, be banished from the practice of the judicious physician." Let us now consider the grounds for such a strong objection as the above.

Dr. Ramsbotham very properly says that it is necessary to determine whether anaesthesia interferes with the uterine contractions. This question is, I think, satisfactorily decided, and experience teaches that chloroform, when properly administered, has
very little influence on the action of
the uterus, sometimes however we have
seen the pains actually increased in
force and frequency, it is true that
if it be given in large doses, so as
to produce a state of deep anaesthesia.
the contractions may be very much
interfered with, may they may be
even stopped entirely, but in ordinary
cases this is not our object.

It has been hinted by Raimondian
and others, that chloroform may
produce dangerous results upon
the foetal in utero. But this too is
contrary to experience. We have seen
patients patients delivered of healthy
children, after having been two
and even four hours under the influence
of chloroform. While Professor Simpson
and others have had patients in a
state of anaesthesia for a much
longer period, while no bad results
have been observed either to the
Mother or the Child. In patients
Labouring under certain diseases of the brain or heart, we perfectly agree with Dr. Ramsbotham, that chloroform may prove injurious. But we are certainly not to relinquish its employment in medical or surgical cases, upon the frivolous suggestion that "Chloroform is a poison" upon the same grounds we might like Macbeth through physic to the dogs" for the same objection would equally as well apply to opium, colchicin and mercury, and almost all our best remedies.

The cumulative action of Chloroform has been urged as another danger. We confess that we have never observed this action, and if the inhalation be properly conducted no danger need be apprehended from this alleged source.

It's liability to cause convulsions has been much insisted upon by...
many writers besides Dr. Rumphius, if this were really the case, we might justly avoid the unhallowed thing, but with the cautions before indicated, this is very questionable, and indeed in a case of hysterical convulsions, we would not scruple to employ chloroform inhalation as a remedy.

The religious objections to the use of anaesthetics in Midwifery have been probably met by Professor Simpson, that I need here only refer to his most admirable pamphlet on this subject.

Chloroform then is undoubtedly of the highest value to the accoucheur, in all cases of painful and difficult labour, and if it were unsafe could we for an instant believe that Dr. Simpson should continue blind to the danger, and persevere in its use. For
none have had such an extensive experience in its use as he, and to
him, a deep debt of gratitude is due by all who experience its
benefits. I have myself not had
many opportunities of employing
it (midwifery), but in no case
that I have attended could any
bad result be attributed to it but
on the contrary the patients appeared
to make remarkably quick recoveries.
I have used it in three forceps
cases and in two of them the
children were born alive and healthy.
In one of these cases I was indebted
to the kind and valuable assistance
of Professor Simpson, who employed
the long forceps, and although
the extraction required the successive
labours of Dr Simpson, Thatcher
and Carmichael, and the mother
was about three or four hours under
chloroform, still both mother &
child did well. This case occurred
in September 1850. The patient
Mary Burns lived on St. Boswell's
Court, College Wynd.
In another case I under Dr. Campbell's
direction applied the long forceps,
but from the contracted state of the
Bum of the pelvis, we were unable
to draw the head through, and
ultimately had recourse to the
perforator; even after the head had
been evacuated, we had considerable
difficulty in extracting it. This
patient was full three hours in
a state of anaesthesia, and made
a most excellent recovery. She
had been delivered previously of three
children all born dead, and from
her own account, we understand that
instruments had been used twice
previously, and turning had once
been resorted to. I have not had
an opportunity of witnessing its effects
in the operation of turning, but can
easily conceive of what an immense value
it will be, from the difficulty I
experienced on one occasion, (while
under Dr. Campbell's guidance) and
the pain caused to the patient, who
obstinately refused to take Chloroform
and who by her struggles, almost
baffled my attempts to born.

We feel convinced that every one
who prudently and cautiously
will make a trial of Chloroform
in painful and tedious labour
as well as in Obstetric operations,
and throwing aside all prejudice,
will very soon learn to appreciate
its value, and be unwilling to let a
passive listener to the agonizing
cries of the parturient woman, when
she possesses such a valuable means
to alleviate her suffering.

It cannot however be denied that
unfavorable and even fatal results
have now and then been observed
in certain parts of our empire,
but these are, I fear, more to be attributed
to its abuse than to its judicious use. And it is impossible to read the numerous objections frivolous as they are, which have ever and anon been urged against it, without being impressed with the belief, that many of them owe their origin, not to a desire of advancing and improving our noble science, but rather to jealousy or some feeling nearly allied to it.

The advantages of Chloroform as an anaesthetic, over Ether, are the following. It is more agreeable to inhale, and is not as irritating to the air passages, more manageable, and not requiring any complicated inhaling apparatus, and it is not as liable to be followed by disagreeable after effects, such as sickness and headache. The cases in which Chloroform is most decidedly of the greatest benefit in surgery are the following. In reducing dislocations of long standing,
in performing the traché in hernia, in the examination of irritable structures and in operations on young children.

In Midwifery it is prominently useful in turning after the membranes have been some time ruptured, in 

Nates and Frottage cases, to relax the external parts & thus facilitate the extraction of the head, and in 
hysterical convulsions.

In the treatment of many medical cases Anaesthesia has been 

proposed, but as its merits have not been sufficiently tested in this 
department, I shall not occupy time in detailing them, and shall merely allude to one Disease in which 
it has been proposed to employ Chloroform, namely Delirium tremens.

In this disease I feel convinced that Anaesthesia, so far from doing any 
good might do infinite harm, 

Dr. A. Wood informed himself, that he 
has seen unfavorable results follow its use.
There is still another subject to be considered in connection with anaesthesia, and which from its difficult and intricate nature, has given rise to much discrepancy of opinion. I allude to the "modus operandi" of anaesthetic vapours. Mr. Wunnely draws the following conclusions from his numerous and highly interesting experiments.

1. That the action of anaesthetic agents is immediately and primarily upon the nerves, that the heart, respiration, and circulation, the blood, and the muscles are secondarily affected.

2. That in the first instance all these substances act as stimulants, that action being more or less prolonged, but to some extent perceptible in all.

3. That the action of anaesthetics is primarily and directly upon the peripheral extremities of the nerves, & principally on that in connection with the cerebro-spiral axis. But C. Wunnely does not deny that their
these substances are absorbed into the blood, yet he does not believe that the precise amount of this absorption is the direct measure of their effect, nor that their mere presence in the blood is the cause of it. Mr. Nunnely's conclusions are certainly most ingenious, and from their being derived from a most extended series of accurate and very scientific experiments, are of great importance.

The more common view is, that these anaesthetic substances, enter the blood by means of the lungs, and being thus conveyed in the circulating fluid, affect the cerebro-spinal system and of course the muscles in connection with this system. But this is still a subject of much discussion, and is well deserving of the careful study of zealous and scientific experimentalist.

When an over dose of chloroform has been administered, nothing answers so well as a restorative as fresh air, and if necessary, artificial respiration.
It was my original intention, had I had time and opportunity to have comprehended in this Essay an account of the actions and properties of all the various anaesthetic agents, which have lately been proposed or employed.

Conclusion:

Medical Science is advancing with gigantic strides, and in this our age, a great discovery has been made, which may vie with any, but can be eclipsed by none. Anaesthesia has been discovered, a want experienced for centuries, need now no longer be felt. After many struggles Chloroform has at length gained a firm and important place in our Medica, and has vanquished objections at first almost insuperable, but now innocent and harmless as if called by its benign anaesthetic influence. Let the self-possessed sceptic test its value, enter our wards and wait our
operating Theatre, and then behold its soothing influence, and if all he sees there, fails to make an impression on him, and he is still unconvinced. To such an one we would say "Go ye incredulous sceptic, go practise your profession, which has become to you but a trade of wanton cruelty and torture, since ye seem the means, which a Kind and bountiful Providence has placed at your disposal; and may your success be such as your inhumanity deserves. With Chloroform is associated the name of Simpson, which all peculiarity will learn, and which will be indelibly traced on the minds of the members of his noble profession, who will justly regard him as gifted with talents that are given to few; armed with a zeal and enthusiasm which are absolutely indefatigable; restless and eager; yet mild, careful, and scrupulous in search for truth; full of a pure and large-hearted benevolence."
"He has made discoveries & improvements in his profession, which are of themselves well capable of transmitting his name safe and honored to posterity. But all are eclipsed in this, his latest and his best. We admire his talents; we praise his zeal; we rejoice in his success; and while we honor his genius, we love the man.

A Good Thesis.

W.G.