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ON THE
INHALATION OF ATOMIZED FLUIDS,

By H. BEIGEL, M.D., L.R.C.P.

[FROM THE LONDON LANCET.]

ON THE TREATMENT OF
CHRONIC DISEASES OF THE LUNGS

BY THE
INHALATION OF ATOMIZED FLUIDS.

By MORELL MACKENZIE, M.D.

[FROM THE LONDON MEDICAL TIMES AND GAZETTE.]

A NEW MODE OF TREATING
DISEASES OF THE CAVITY OF THE NOSE.

By J. L. W. THUDICHUM, M.D., M.R.C.P.

Lectsonian Professor of Medicine of the Medical Society of London.

[FROM THE LONDON LANCET.]

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CODMAN & SHURTLEFF,

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Boston, March, 1869.



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From the London Lancet.

ON THE INHALATION OF ATOMIZED FLUIDS.

BY H. BEIGEL, M.D., L.R.C.P.

THE application of medicaments is effected in a two-fold manner, viz.: either directly on being applied immediately to the suffering part, or indirectly by being received into the circulation of the blood; so that through this agency, which reaches all parts of the body, it may also affect those parts on which we intend to act. Where a direct influence is possible to the physician, he will never think of attempting to reach his aim by circuitous routes. The straight way in medicine is also the best and most effectual, and those branches of our art which could pursue this direct track have enjoyed quick and conspicuous progress. We need only call to our mind surgery, ophthalmology, midwifery, and partly also, the treatment of skin diseases.

But it is not very long since, that even in such cases as catarrh of the conjunctiva, simple ulcers, scabies, &c., very many compound medicines were ordered,—a kind of therapeutics which disappeared with the development of local treatment. Many parts of the body will certainly, by their position, ever exclude a direct proceeding in the matter just spoken of; as, for instance, the basis cranii, the heart, the pancreas, spleen, kidneys, &c., because no natural duct leads us to them. But the natural ways leading to others, which are therefore within our reach, have not been sufficiently appreciated. This was the case with the organs of respiration. The cavum oris and the pharynx were too easily accessible to be overlooked; but the glottis was considered a stoppage for any further advance, and the trespassing on which is almost impossible. One thing remains remarkable: It has always been observed, that one of the most important occurrences in life, respiration, proceeds in the most immediate manner; that the inhalation of different gases produces very marked effects upon the organism; and although man was, and usually is, so ready to imitate easily explicable phenomena of Nature, and to use them for his benefit, nevertheless the attempts to gain influence upon the body, and particularly upon the organs of respiration, through breathing an artificially-created atmosphere, were very rare.

Grecian, Roman, and Arabian physicians recommended inhalations, but never attempted to use anything but vapors and fumigations; so

that a non-volatile chemical body could not come into contact with the organs of respiration. But at all times the urgent necessity of immediate application of medicaments in the organs of respiration was so much felt, that Mascagni, a very renowned physician, once said, "if ever a specific should be devised against consumption, it would be such as to be introduced into the organism through the windpipe." Besides this inhalation, some physicians of later date made use of blowing pulverized medicaments into the larynx in diseases of that organ. Aretaeus made use of a tube for blowing, which method in our times has been renewed with great benefit by Troussseau and other physicians. In many Continental spas, arrangements were made to create an atmosphere suffused with mineral water, which the patient was recommended to inhale. But, inasmuch as the mineral water was turned into vapor, it need not be said that the so-called "vaporatoria," or inhalation saloons, were filled merely with common water vapors.

In 1849, Auphan, of Euzet-les-Bains, originated the idea of atomizing the mineral water, by throwing a jet of the liquid against the wall of the inhalatory. After a short time, the same system was adopted in Lamotte-les-Bains. But Sales-Giron first constructed at Pierrefonds an apparatus through which the fluid was subdivided into a fine vapor, which was inhaled by the patients with great benefit. His chief merit consists in his transferring this method from the vaporatory of the spas, to which it was hitherto restricted, into the hands of every physician, by devising a portable inhalation apparatus. Thus a long-cherished wish of physicians was realized, and from that time a new era in the local therapy of the organs of respiration commences. This apparatus of Sales-Giron consists of a vessel filled with the fluid which is to be atomized. Above this vessel an air-pump is placed, which compresses the air above the surface of the water. The pressure is indicated by manumetre. The water escapes through a fine opening of a tube, and strikes against a small metal disc, where it is turned into very minute vapor, which is inhaled by the patient. When Sales-Giron placed the results obtained in his vaporatory, and some years later his portable apparatus, before the Académie de Médecine, of Paris, great sensation was caused. At first, it was questioned whether the atomized fluids reached the larynx, the trachea and the lungs. Different opinions arose, and various experimenters arrived at different results. Meanwhile the new method gained more partisans. At last the Académie de Médecine took the investigation into their own hands; and, on Jan. 7th, 1862, Poggiale, the reporter of the elected committee, in a deeply interesting, extensive, and brilliant discourse, gave a substantiated statement of the case, based upon experiments. This statement was entirely in favor of the new method; and it was experimentally proved also by other authorities, that not only the vapor, but the chemical bodies, which, by being atomized, are incorporated into it, reach not only the trachea, but the cells of the lungs.

Some time after, (in 1859,) Matthieu constructed an apparatus which he called nephogine, and exhibited it before the Académie de Médecine. But the greatest simplicity in the construction of the

inhalation apparatus was attained by Dr. Bergson. He placed two glass tubes with very fine openings at one end, at right angles to each other; the other end of one tube dips into a vessel filled with the fluid which is to be subdivided, while the other is fastened to a caoutchouc tubing, about a yard in length. At the middle of this tubing is attached a rubber ball, and the end extends into a ball also, so that the one in the middle represents an air reservoir, and that of the end a pair of bellows. If the latter is pressed by the hands of the patient, the air in the upper ball is compressed, escapes through the fine opening, and causes a vacuum in the other tube; the fluid of the vessel then ascends through aspiration, and is turned into fine mist when leaving the capillary opening. (See figure 3, page 18.)

Upon this principle, which is as excellent as it is simple, Siegle has based his inhalation apparatus; putting aside the bellows, which fatigued the hands of the patient very much, and substituting a vapor kettle, into which one of the tubes descended. The vapor issuing forth effects the same purpose as the bellows, and the patients inhale comfortably. One inconvenience which all the apparatus had in common was, that the cloud of vapor containing the subdivided fluid, not only rushed into the mouth of the inhaler, but moistened also his face. With indifferent medicaments this was only disagreeable; but with liquids of a more acrid or caustic nature,—as for instance nitrate of silver,—it was not only disagreeable, by reason of leaving black spots on the face and forehead, but even injurious as a caustic for the eyes. (See note.)

If we set aside the effect, praised by Demarquay, Leiblinger, and others, in conjunctivitis and keratitis, likewise the effect upon the ear, upon ulcers, &c., and only consider the effect upon the organs of respiration from the mouth and pharynx with its arches, the uvula, the glands through the larynx and trachea, with its ramifications to the lungs, we meet with a great number of diseases upon which the local therapy just spoken of exercises a great influence. But as the respiration is performed more or less powerfully and deeply, the atoms of the pulverized fluid reach the more or less distant organs of that function. From this fact it becomes self-evident that it will be necessary to respire feebly, if the influence should be directed upon parts situated in the mouth or pharynx; more powerfully and sometimes strenuously, if it should be our intention to act upon the larynx, trachea, or lungs. And further, as the lungs admit the greatest amount of air when the sitting position is assumed, it is manifest that we should place the patient in that position if we intend a deep penetration of the atomized cloud, whilst we should allow him to stand if we merely intend to act upon organs not so far distant. I do not intend to allude to such individuals as are excited and nervous at the aspect of every, even the most innocent instrument. Suffice it to say, that the inhalation apparatus do not enjoy an exception. But there are persons—happily not frequently met with—whose respiratory channels are so sensitive, even in a healthy state, that they cannot bear inhalations, either with pure water or any other

NOTE.—The use of the Shield (described with Fig. 15, p. 17, and Fig. 5, p. 19,) serves to surmount these inconveniences most perfectly.

fluid, at the first attempt, and several sittings are necessary to accustom them to the process. All cases of high sensitiveness which I have hitherto observed were patients with laryngeal diseases; whilst with others, and particularly with those suffering from diseases of the lungs, inhalations agreed very well.

The temperature of the atomized cloud, of course varies in proportion to the distance from the spout of the apparatus, and must be regulated according to the nature of the special case. For some patients, it is even necessary to have the fluid to be atomized, warmed. When the apparatus is in order, and ready to act, the patient stands or sits, and inspires more or less powerfully and deeply, according to the requirement of the case. The advice which has been given, that the patient should put out his tongue and keep his nostrils closed, when inhaling, is, in my opinion, superfluous and useless.

It would exceed the limit allowed me were I to attempt to treat on all the diseases against which atomized fluids in general, and especially inhalations, have been beneficially used. Demarquay has applied them in many cases, pharyngitis-granulosa, ulcera-syphilitica, laryngitis-chronica and syphilitica, phthisis, &c., and reports that cure or improvement has often been obtained in a few days. Other authors, Zdekauer, Fieber, Schnitzler, Gerhardt, Lewin, Waldenburg, McKenzie, Gibb, and others, report favorable success by inhalations in cases of whooping-cough, asthma, inveterate bronchitis, aphonia, tuberculosis, gangrena pulmonum, pneumonia, bronchiectasis, emphysema, &c.

The number of the cures effected, as well as the time in which the cure took place, is far more favorable than in similar cases which were treated internally, and my own experience induces me to agree with that statement. The inhalations form a real specific in certain cases of hemoptysis, in cough which is a result of eccentric irritation of the larynx, or trachea, in hoarseness and aphonia as consequences of acute or chronic inflammation of the mucous membrane of the larynx. The cure is sometimes effected with amazing rapidity, after many other medicaments have been applied without effect. Of many cases which I have observed, I shall here mention a few only.

Case 1. A. B.—; an unmarried lady, consulted me at the end of last year for hoarseness, from which she had suffered for several years, and which was the more unpleasant to her, as she sang well, and a great deal, previous to that affection,—a pleasure the deprivation of which gave herself and her friends great concern. The voice was coarse and without *timbre*; the larynx was painful only at the beginning; now it is indifferent to external pressure. Laryngoscopy can easily be effected, and shows only a slight unnatural redness of the mucous membrane of the larynx, and of the vocal ligaments. No other inconvenience exists. In course of the affection a great many medicines were tried, and all without any effect. I applied inhalations of alum (ten grains to the ounce of water.) After three applications a striking improvement was observed, which, after five, was so complete, that I discharged the patient, advising her not to

sing yet; but after a week she could no longer resist, therefore resumed singing, and sang as before the affection.

Case 2. C. D—, a merchant from Lima, advised by his physicians, left that country and came to England. His suffering consisted in a severe attack of a very troublesome cough, which came on every eight or ten days, and lasted for a day or two, and then ceased. During that time the sputa were tinged with a good quantity of pure blood. After each attack the patient felt very exhausted. When he came under my observation, he was very pale and emaciated; his voice was coarse. The result of physical examination was infiltration of the left apex; otherwise the conditions were normal. Three days after the examination he had a severe attack; he coughed frequently and very severely, and was not ten minutes without coughing. The sputa consisted more of blood than mucous, and were very copious. The quantity of blood he ejected during the day was about two tea-cups full. I ordered immediately an inhalation of tincture of sesquichloride of iron. The cough did not decrease; but the sputa, after the first inhalation, was not tinged. The patient inhaled twice a day, and had, altogether, thirty inhalations. The intervals between the attacks were, in the meantime, much prolonged. Blood never appeared during the cough, which altogether disappeared when extract of hyoseyamus was substituted for the above-mentioned liquor. The appearance of the patient had very much improved; and after six months' stay in this country he again returned to Lima, whence he has repeatedly written, assuring me of his perfect health.

Case 3. E. F—, a vocalist, had caught a severe cold, in consequence of which he was very often attacked with considerable pain in his throat of a choking character; he felt, besides, a burning sensation in the larynx, and his face was covered with perspiration. Each attack lasted about ten minutes, when it disappeared and returned several times in the course of the day. There was no typical appearance to be observed. The larynx was indifferent to external pressure. The result of laryngoscopy was negative. Blistering, internal application of the acetate of morphia, cannabis indica, opium and iron, were had recourse to, but without any effect. I applied acetate of morphia by means of inhalation, (half a grain to an ounce of distilled water,) and the effect was, a perfect cure after ten applications.

In conclusion, I shall proceed to make a few remarks on the *medicaments I use for inhalation*. Generally speaking, every chemical body which is soluble can be atomized, and therefore inhaled. The largest number of remedies contained in the *Materia Medica* can therefore be used for the local therapy of the respiratory organs. But it must be borne in mind that, besides the local effect, the medicaments are much more readily absorbed through the mucous membrane than they are by internal application,—a fact which must be taken into consideration, when the dose is to be decided on.

The following medicaments are those mostly recommended and

found beneficial by practitioners engaged in treatment by inhalation, and which I can recommend from my own experience:—

1. In inhalatory treatment of the respiratory organs, nitrate of silver deservedly occupies the first place. Its dose is three to five or ten grains, in one ounce of distilled water. It is particularly serviceable in inflammatory conditions of the pharynx and the larynx. The strength of the solution, the frequency of the sitting, and the duration of the same, must be adapted to the nature of the particular case, It need scarcely be mentioned that proper care must be taken if strong solutions are inhaled.

2. Much milder in its effects is nitrate of alumina, which, as far as I am aware, was first used by myself in inhalations. I prepared it from a simple solution of the metal in nitric acid, working the crystals in distilled water repeatedly, condensing the solution by evaporation and recrystallizing. It rendered good service, not only in inflammation, but also in nervous affections of the larynx and trachea. The dose is three grains in an ounce of distilled water.

Very useful medicaments are the following:—

3. Tannin,—three grains to eight or ten grains in an ounce of water.

4. Alum,—four grains to ten or fifteen grains, ditto.

5. Solution of sesqui-chloride of iron,—one minim to five or ten minims, ditto.

6. Corrosive muriate of mercury,—four grains to one or two ditto.

7. Acetate of lead,—a grain and a half to eight grains ditto.

8. Sulphate of zinc,—half a grain to five ditto.

9. Common salt,—which has long been considered a most useful agent in the treatment of diseases of the respiratory organs. On the supposition that it was present in the atmosphere near the sea and saline springs, physicians have been in the habit of sending thither patients affected with chest diseases; and to give the full benefit of it to those who were not able to travel, it had always been the object of physicians to create an artificial *sea air*. But it is only since the invention of the inhalation apparatus that this object could be fulfilled. The application of common salt for the purpose of inhalation is therefore very extensive, and produces very marked effects. I make use of it in doses of from five to ten and twenty grains to an ounce of water; and one ounce is effective, particularly in diseases of the lungs and windpipe. In nervous affections, particularly of the larynx, and also the asthma, narcotics have been used especially.

10. Tincture of opium,—one to ten minims in an ounce of water, and the preparations of opium.

11. The salts of iodine, bromine, chlorine, and some others. Authors report the good effects of arsenic, in the shape of Fowler's solution, and in a dose of half to five minims in an ounce of water. Lastly, besides the different mineral waters, there must be mentioned:—

12. Pure or distilled water, cold or warm, or even as hot as the patient can bear it. It renders, in many cases of inflammation and paralysis of parts of the larynx, good service.

From the London Medical Times and Gazette.

ON THE TREATMENT OF CHRONIC DISEASES OF
THE LUNGS BY THE INHALATION OF ATOMIZED
LIQUIDS.

BY MORELL MACKENZIE, M. D.

The author, after an elaborate description of the various instruments invented for the purpose of introducing medicine by means of inhalation, enters into an account of the apparatus invented by Dr. Siegle, of Strasbourg, and himself, which he describes. Dr. Siegle's simple apparatus is an excellent one, and the author stated that he had often used it with great advantage. After enumerating the physicians and physiologists who had worked at the subject on the Continent, the author analyzed the experiments which had been performed by Demarquay, Fournie, Brian, and others, on rabbits and dogs. He then related his own experiments, which had been carried out in conjunction with Dr. Duchesne, of Woodford. After detailing various experiments performed on pigs and dogs, Dr. Mackenzie sums up the results. 1st, Demarquay's and Brian's experiments on dogs; 2d, his (Dr. Mackenzie's) on pigs and dogs; 3d, an experiment performed by Demarquay, in the presence of numerous witnesses, on a woman with a tracheal fistula, in which it was shown that the inhaled liquid penetrated to the trachea, though there was a great obstruction at the upper opening larynx. This experiment which has been previously unsuccessfully performed by Fournie, has since been repeated by Lieber, Schnetzler, and others, with result, similar to those obtained by Demarquay. 4th, the fact first shown by Bataille, and since by Moura Bourouillou, the author, and others, that after the inhalation of a colored atomized solution the sputa remained tinged long after the employment of the laryngoscope could detect any traces of the material used. On the one hand there was an immense number of positive proofs of the penetration of atomized liquids: on the other hand there were a few experiments performed, with negative results. It was scarcely necessary to remark that any experiment might be performed—the most simple chemical test employed—in a manner to insure failure.

But a few experiments of this sort could have little weight against the mass of evidence on the other side. The author stated that the greatest benefit from this system of therapeutics might be expected and had resulted, in bronchitis, asthma, and hæmoptysis. He brought forward twenty-two cases treated between October, 1863, and January, 1864. There were ten cases of bronchitis, six of phthisis, two of hæmoptysis, three of asthma, and one of whooping-cough. The author did not believe that in phthisis the treatment

would have a positively curative effect, but was beneficial in cutting short intercurrent bronchitis. Of the twenty-two cases detailed, only two were unable to make use of this curative process. Of the ten cases of bronchitis, eight were cured, one relieved, and one obtained no benefit. The average duration of the time required for curing these cases, though most of them were severe, and of long standing, was only fifteen days and a quarter. The shortest time was six days, (a severe case); the longest forty days. The duration of treatment was not in proportion to the severity of the disease, one mild case requiring twenty-eight days to get well. Of the six patients laboring under consumption, two were unable to use the inhalations on account of the irritation which they caused. Of the remaining four cases, while the physical signs did not undergo any material alteration, the local symptoms (expectoration, pain and cough) were greatly relieved. The general health was much improved in two cases, Nos. 11 and 15, slightly in a third, and not at all in a fourth. In two cases of hæmoptysis, one severe and the other slight, the atomized liquids rapidly stopped the bleeding. In three cases of asthma, one a very severe case, which had obstinately resisted the ordinary treatment, this system of therapeutics soon gave relief. In one case of whooping-cough (in an adult) the inhalations gave immediate relief, and quickly effected a cure. The author stated that during the past year he had used atomized liquids in more than eighty cases of diseases of the lungs, and that he had found the plan of treatment no less successful than was detailed in this paper.

The various instruments referred to in the communication were brought before the society, and likewise diagrams illustrating their action and method of employment. Dr. Gibb said that the subject of the author's paper was one of the highest importance, and in which he took the greatest interest. In the earlier part of his professional career, he (Dr. Gibb) had looked forward to the time when some means might be devised for introducing fluid in a minute state of division into the interior of the bronchial tubes, which would prove more certain in its effects than the vapor inhaled from certain substances. From the evidence brought forward by the author, illustrated by experiments of his own and Continental investigators, he had not the slightest doubt that any atomized fluid reached the minutest bronchial tubes and air cells; and from his own experience of the inhalation of fluid thus atomized or pulverized, he was quite satisfied such was the case. With Sieglé's atomizer, he had caused the inhalation of a solution of the iodide of silver, for a few minutes only, in a case of rapid phthisis in the second stage of the disease, with profuse expectoration and laryngeal mischief. The effect of this was, a general feeling of warmth throughout every part of the chest, and subsequent diminution of the expectoration. This feeling of warmth so generally diffused, convinced him that the atomized fluid had reached the minutest bronchi. As a palliative in some cases of phthisis, and as likely to diminish the amount of expectoration, the inhalation of atomized fluids would prove useful; but it never could be relied upon as a curative agent in this disease. With regard to bronchitis, the chronic form especially, asthma and hæmop-

tysis, his own experience agreed with that of the author, and showed that in many cases the greatest amount of relief could be obtained. Indeed, he had been surprised at the good results which sometimes followed,—in the two former, especially. As furnishing an additional and most useful therapeutic agent, in the treatment of laryngeal and chest diseases, the inhalation of certain atomized fluids must be regarded as one of undoubted value, and he (Dr. Gibb) gladly bore testimony in its favor.

From the London Lancet.

ON A NEW MODE OF TREATING DISEASES OF THE CAVITY OF THE NOSE.

BY J. L. W. THUDICHUM, M. D., M. R. C. P.,

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The treatment of diseases of the cavity of the nose has hitherto been attended with very great difficulties, owing to the circumstance that the cavity is large, complicated by many sinuosities, interrupted by many thin, bony and membranous projections, and therefore little accessible, and for the most part not accessible at all, to instruments by which growths might be removed, or topical remedies applied. The removal of excrescences from the lower and median nasal canal was yet the most successful of surgical operations, although it was frequently left incomplete, or remained unavailing, owing to the speedy return of the polypi. But the topical application of remedies for the treatment of acute and chronic affections of the nasal cavity, which is certainly the principal therapeutic requirement, and in many cases prevents the formation of polypi, could only be attempted by mechanical contrivances which were so objectionable to the patients, that, after longer or shorter trials, they had to be abandoned. I have had under my own care, several important cases of affection of the nasal cavity, in which the mere possibility of cleansing the cavity of the nose would have been a great boon to the patients; others, in which I have no doubt the application of remedies, such as we are in the habit of using in conjunctivitis, would have effected a speedy recovery from painful and troublesome conditions. The only mode of cleansing the cavity of the nose, which was then known in medical science, was by injections with a syringe; but, owing to the velocity with which the injected fluid touched the walls of the nose, this process always created much irritation, pain, sternutation and lachrymation, and the patients mostly opposed the entrance of the fluid by expiratory efforts, which, indeed, were the only means they had of preventing the fluids from running down the choanæ and reaching the larynx. The mere effect of pure water upon the Schneiderian membrane being highly irritating, two causes

combined to defeat the object of injections of water; and when medicines which might be supposed to have a beneficial effect upon the diseased Schneiderian were dissolved in the water, they, although perhaps better tolerated than pure water, could not be kept sufficiently long in contact with the affected parts to exercise upon them even such slight medicinal action as their necessarily diluted state permitted. There was a third application that could be made,—namely, the introduction of medicines in the form of fatty or mucilaginous ointments. In one case in which I endeavored to benefit a chronic ozæna—a residue of scarlet fever—by topical applications, a solution of sulphate of zinc in intimate mixture with lard, had a most decided effect, the patient being much improved, though not cured. But this application of ointment to the surface of the lower canal of the nose, and to a part of the median canal, (which are the only portions that, as a rule, can be reached, even by clever manipulation,) is the most objectionable of any, so far as its accompaniments of irritation and pain are concerned, sternutation and lachrymation being not rarely long continued after it, and the peculiar pain producing a reluctance on the part of the patient, which it is difficult to overcome in young and old people. All these applications, then, were partial, imperfect, irritating and consequently unavailing to effect the desired end. Many cases of superficial ulceration ended in caries, embittering the life of the patients, and through the odor making intercourse impossible and family relations troublesome; other cases of chronic inflammation ended in deformity of the external nose and the formation of polypi in its cavity, and produced a constant false resonance of the voice; a number lasted throughout a lifetime, the nose being a constantly weak part, and capable of prostrating the patient at any opportunity which dust and wind might afford; others had consequences even more severe, and the specific ulcerations of the cavity of the nose only too frequently terminated in that sinking of its bridge, which is the most painful proclamation of disease with which a patient can become afflicted. Then there were the convulsive affections produced by local irritation in the nose—those cases of fabulous sneezing in which hardly any remedy availed, even in diminishing the number of spasms in time, because the centre and seat of the irritation could not be reached by medical agencies. Truly dangerous were some cases of bleeding from the nose, in which the broken blood-vessel could not be reached by either styptics or mechanical compression, and could not be made to contract by contact with that most powerful of hæmostatic agents, ice or ice-cold water. Not a few cases of this kind terminated fatally, or required the most desperate measures to prevent the fatal end, such as plugging of the nose and choanæ with sponges or tinder; and these not rarely left a condition of anæmia in which other accidental diseases could put a stop to life with comparative ease, or which continued without the supervention of other diseases, enfeebling and considerably shortening the rest of the life of such patients.

All these difficulties, and many more which might be mentioned, are removed at one stroke by the discovery of Professor Weber, of Halle: that when one side of the nasal cavity is entirely filled

through one nostril with fluid by hydrostatic pressure, while the patient is breathing through the mouth, the soft palate completely closes the choanæ, and does not permit any fluid to pass into the pharynx (a physiological fact thus far already discovered by E. H. Weber, of Leipzig, before 1847, and published in Muller's *Archiv*, 1847, pp. 351-354); while the fluid easily passes into the other cavity, mostly round and over the posterior edge of the septum narium, in some persons also through the frontal sinuses, and escapes from the other open nostril, after having touched every part of the first half of the cavity of the nose, and a great part, certainly the lower and median canal, of the second half. By means of the application of this principle to the treatment of diseases of the nose, it is possible easily and frequently to wash the nasal cavity, to disinfect and deodorize it, to remove the sordes which accumulates so easily in it, and to apply to its surface a great number of beneficial medicinal substances, so as to prevent acute affections from extending, and to incline them towards a speedy recovery: to stop hæmorrhages, allay irritations, and subdue in a remarkable manner, chronic affections of the Schneiderian membrane, so as to reëstablish a perfectly healthy surface and normal condition of the organ of smell.

*The Apparatus.**—A rod of iron or brass, thirty inches in length, is fastened upright into a heavily-loaded foot, so as to form a firm stand. On this rod slides a nut which can be fixed at any height by means of a screw, and carries an arm and ring, in which is cemented a high cylindrical glass vessel of a capacity of from one to two pints. The glass vessel is open above, and its cavity contracts within the ring in which it is fastened, here directly to pass into a small-bore muzzle, to which a suitably-sized flexible india-rubber tube, thirty-six to forty inches in length, is fastened. To the other end of the india-rubber tube a stop-cock is fixed; upon this a little cup-shaped collar, and upon this the cylindrical perforated muzzle of gutta-percha or of prepared india-rubber. If now the glass vessel is filled with fluid, and the little stop-cock immediately underneath the nozzle is opened, the fluid will escape at the fine openings of the nozzle; and if the nozzle accurately fits the nostril, and the fluid is allowed to flow, the fluid will enter and fill the cavity of the nose, as will be more specially described hereafter. Great care must be taken to ensure an adequate fitting of the nozzle to the nostril of the person who is to be operated upon, as, if fluid escape by the side of the nozzle, it makes the operation difficult and troublesome. It is therefore necessary to have several sizes of nozzles, to be fixed upon the stop-cock at will. In order to avoid all possible chances of infection, and ensure cleanliness, I lay it down as a desideratum, that every person using the apparatus should have his or her own nozzle, to be used exclusively by that person. In dispensaries and hospitals, where this cannot be so easily effected as in private practice, the utmost care should be exercised to clean the nozzles from any semi-solid matter which easily becomes firmly adherent to them. As the current is always directed outwards through the openings, there is

* For the description of apparatus as manufactured by us, see page 23.

hardly any chance of the interior of the nozzle becoming unclean or infectious. Yet it will be well to give to each patient, particularly if he be the subject of specific disease, his own apparatus. Even the suspicion that a patient might, by accident, blow into the tube and endanger his successor, will thus be avoided.

Of the fluids to be employed for rinsing the nose.—Pure warm water, when introduced into the nose by means of the apparatus, causes, in most persons, a very disagreeable sensation, ending in lachrymation and sternutation (or tears and sneezing), with subsequent copious discharge of watery mucus from the nose. If the quantity of water run through the nose be large, the "cold" produced thereby, including the change in the sound of the voice, may last for some hours. To avoid this objectionable symptom, it is best to employ solutions of common salt, or other salts, of sugar or milk for rinsing the nose. In the course of practice, cases will arise in which all these solutions offer advantages. For general use, a solution containing one ounce of common salt in a pint of water, is satisfactory. Some persons will bear less salt; others will tolerate more. Of this solution, having a temperature rather lower than that of the blood, from one to four, or if desired, any number of pints, may be allowed to flow through the cavities of the nose. It does not easily produce sneezing, rarely lachrymation, and hardly ever any subsequent symptom of cold in the head. The saline solutions which, next to common salt, offer the greatest advantages, are those of the common phosphate of soda, and phosphate of ammonia and soda. They can be used by themselves, or mixed with the common salt. Their alkalinity has a beneficial effect upon the irritated Schneiderian membrane, and dissolves or loosens any deposits of mucus or pus, which so frequently dry and harden upon the surfaces of the nasal cavity.

Of the fluids to be employed for deodorizing the nasal cavity.—For this purpose I have employed dilute solutions of permanganate of potash. This agent has done me such excellent service in removing the fetor of the mouth in cases of typhoid fever, that I was induced to apply it for the removal of the fetor of ozæna, and with the most striking and immediate success. A solution of from one grain to ten grains in a pint of water is a good proportion, according to the severity of the case. The solution tastes alkaline, and acts as a feeble escharotic upon healthy and particularly upon vascular and erythematous parts. When the margin of the nostrils is excoriated, the permanganate colors the excoriated part brownish; but the effect of this is rather beneficial than otherwise, as the excoriated and colored part dries easily, and after the shedding of the faint brownish pellicle, appears healthy.

Mode of applying these and other fluids to the nose by means of the apparatus.—The fluid, of the proper composition and temperature, is filled into the glass vessel. All air in the india-rubber tube is now replaced by fluid, the escape of the air upwards being facilitated by gentle manipulation. The glass vessel is raised and fixed in the position which will give the desired pressure. A little fluid is now allowed to escape from the nozzle, to make sure that all air is ex-

pelled. The patient (or healthy person, if it is only desired to show the physiological experiment) is seated in front of a basin, with his head and face slightly bent over it, the apparatus standing by his side. He is told to breathe through his mouth exclusively, and to abstain from swallowing. The nozzle, previously selected as of proper size, and connected with the apparatus, is now inserted into one of the nostrils, and held there by the patient's hand of the same side. The little stop-cock (or tube) is now opened, and after a few seconds a continuous and rapid stream of fluid is seen to flow from the opposite nostril into the basin below. Persons who have control over themselves will always bear the experiment as here described; but young persons, nervous females, and children, become confused, begin to cry, or to swallow and breathe through the nose. In such cases the level of the fluid in the glass should be very little above the level of the introitus into the external ear, so that the fluid runs very slowly, or only drops out of the free nostril. The hand of the operator should be upon the india-rubber tube, to close it by compression the moment he sees bubbles come through the nostril, or perceives that the patient swallows or becomes confused. It is always well to let the fluid pass at first under slight pressure, in order to allow sordes within the nose to be loosened and crusts of dried matter to be softened. When this has been effected, it is useful suddenly to raise the glass vessel and produce a rapid stream, which will then scour the impurities away. In some cases I have done this repeatedly with success. The loosening of crusts and lumps of inspissated mucous is always attended with some irritation, and also with retardation and diminution of the current of fluid. The sudden increase of the pressure is the surest means of causing the least inconvenience to the patient, and effecting in the quickest manner the purpose of the operator. It is also well to reverse the current now and then, as sordes are much better detached in that manner. If only one nostril is diseased, or the principal seat of the disease, I allow the fluid to enter by the opposite side, and to leave by the affected nostril. I then change the current, and filling the affected nostril, allow the current to leave by the healthy one. Thus, half a dozen or a dozen changes may be usefully instituted. It is really surprising what an amount of sordes will sometimes be removed from the nose by the rinsing process. Any one who has seen it once, will easily conceive the manner in which, by means of these constant accumulations, nasal diseases become chronic, incurable, and lead to fearful suffering and death. When water has been allowed to run through the nose, it takes two minutes and a half, before the sense of smell returns to its integrity. When saline solutions have been used, it takes about a minute and a half; but after the alkaline solutions a minute suffices to allow the perception of odors to be clearer than before the application. If the special excitant of the olfactory, as the perfumers term it, the neutralizer and stirrer-up of smell, ammonia, is applied immediately, even in less time than a minute will be sufficient.

There are cases of chronic coryza, with some blenorragia, in which the affection of the Schneiderian membrane prevents patients

from satisfactorily performing their business, which requires a full command of the organ of smell. Chemists, perfumers, wine merchants, provision merchants, and others, may belong to this category. In cases of this kind the topical treatment is beneficial. After the application of alkaline solvents in particular, the sense of smell is clearer.

I hope that the advance which we are making in the treatment of diseases of the nose, may be shared by its physiology. There is no greater enjoyment of Nature's triumphs, and no greater safeguard against noxious things of all kinds, than a healthy nose.

Of the medicinal solutions which may be applied to the cavity of the nose.—Although the solutions before enumerated act in a measure as alteratives, resolvents, and escharotics, and, therefore, rarely constitute a sufficient medical application by themselves, yet they are more frequently used for preparing the nose for the application of more energetic and specifically acting solutions. To this latter class belong the solutions of alum, sulphate of zinc, and sulphate of copper—the best astringents; the solutions of nitrate of silver, and bichloride of mercury—the most suitable alteratives; and the solutions of chloride of calcium, in which suboxide or oxide of mercury is suspended in a finely subdivided state, together with the bichloride solutions—the best specifics. Of stimulating solutions, a mixture of eau de Cologne with water or salt water, is sometimes useful.

The probable concentration of these solutions can be surmised from the circumstance that the sensibility of the healthy nasal cavity stands about midway between that of the eye and the mouth. When the nasal cavity is completely filled with fluid, the specific sense of smell cannot any longer be exercised; even the solution of eau de Cologne is not perceived to be such when it once fills the nose. The sense of smell being thus entirely obliterated by the fluid contained in the nose, the reflex effects which substances may exercise by means of this sense are entirely absent; and the only impingement which the fluids can produce is upon the filaments of sensitive nerves coming from the fifth pair. It is owing partly to this circumstance that comparatively strong medicinal solutions are borne by the nasal cavity without great secretion. Another circumstance favoring the application of stronger solutions is the ready manner in which the healthy service of the nose defends itself against irritating, chemically-impinging substances by means of a copious flow of mucus. Excoriated or ulcerated parts lack this power of rapid secretion; and hence they are affected by medicinal solutions much more than the healthy parts of the surface of the nasal cavity. What is here stated is the general result of experience and experiment; but, at the same time, I must insist that the application of medicinal solutions in each case should be begun with the greatest caution, as individuals differ greatly in point of irritability of the nasal cavity. In the beginning, therefore, very dilute solutions of medicinal substances should be used, and their strength be increased gradually, after their effect has been well exhausted, by the use of greater quantities, applied by a quick flow, or the use of smaller quantities in a slow current distributed over a longer time of contact.

Solution of alum.—Half an ounce of roughly-powdered crystallized alum is dissolved in a small quantity of hot water, and the solution made up to one quart by means of cold and tepid water in such a manner as to ensure that the temperature of the solution should be below, but near to, blood-heat. In superficial ulceration or blenorrhagic conditions this solution is well borne. Ulcerated parts, which, before its application were red, mostly appear as white patches after its application, thus showing that the effect of the alum on the ulcerated surface has been considerable. When I was desirous to manage with smaller quantities of solutions, I have sometimes mixed a little permanganate solution with that of alum.

Solution of sulphate of zinc.—From a scruple to a drachm of the sulphate of zinc, dissolved in a quart of warm water, together with half an ounce or an ounce of sulphate of soda or sulphate of magnesia, gives a suitable fluid.

Solution of Sulphate of copper.—Of this sulphate also from a scruple to a drachm, mixed with half an ounce or an ounce of soda sulphate or magnesia sulphate, can be dissolved in a quart of warm water.

Solution of acetate of lead.—Of this crystallized acetate from a drachm to two drachms, together with half an ounce or an ounce of crystallized acetate of soda, may be dissolved in a quart of warm water.

Solution of nitrate of silver.—Of this salt not more than from half a grain to a grain should be dissolved in each ounce of water. A quart of water, therefore, in which previously from half an ounce to an ounce of nitrate of soda has been dissolved, may receive from sixteen to thirty-two grains of the nitrate. In particular cases the solution may be made stronger. The nitrate of potash is not so good as the nitrate of soda, because it has slightly irritating qualities. When it is necessary to use it in an emergency, when soda nitrate cannot be had, the solution should be more diluted.

Solution of bichloride of mercury.—The greatest caution is necessary in the use of this agent, as it has a tendency to produce excoriations on healthy surfaces. The first solution to be employed should be one containing five grains of corrosive sublimate in a quart of water, in which an ounce of common salt is also dissolved.

Solution of chloride of calcium with suspended oxide or suboxide of mercury.—These fluids are the common phagedænic waters, or black and yellow wash, to which common salt has been added. Two drachms of calomel, twelve fluid ounces of lime-water, one ounce of common salt, and twenty ounces of warm water, yield the black solution. One scruple of corrosive sublimate, one ounce of common salt, twelve fluid ounces of lime-water, and twenty fluid ounces of common warm water, yield the yellow wash. These mixtures must be well agitated in the glass vessel while being allowed to run through the nasal cavity.

Sedative solutions.—Of prussic acid forty minims to the quart of warm salt water, of tincture of opium two drachms, may be taken. These drugs may be added to some of the above solutions of metallic salts. But if this is desired, it is better to substitute a solution of

morphia for tincture of opium. The prussic acid is incompatible with the copper, silver, and precipitated mercury solutions: it goes conveniently with the alum and common salt solutions.

Styptic or hæmostatic solutions.—Amongst these, ice-cold salt water, containing an ounce of salt to a pint of ice-water, takes the first place. When this, after having been continued for a considerable time, is insufficient to stop the hæmorrhage, a fluid ounce of the tincture of the sesquichloride of iron may be added to each pint of ice-cold salt-water.

Stimulating solutions.—One ounce of eau de Cologne upon ten ounces of salt-water, is a useful stimulant. Strong spirit of wine may be taken in place of the eau de Cologne.

I have now fully, and for some readers, perhaps, somewhat too explicitly described a number of medicinal solutions which may with advantage be applied to the treatment of nasal diseases by the method in question. I was desirous to impress upon the memory of the reader the fact that I recommend only such solutions as are brought up to a certain specific gravity by salts which do not decompose the medicinal agents. There may be cases in which it is desirable to swell the Schneiderian membrane by watery fluid and produce endosmosis, and others in which highly concentrated solutions may beneficially be used to effect exosmosis and shrivel Schneider's membrane. These adaptations, and the various accommodations of the fluids and their degrees of concentration, I must leave to the skill and ingenuity of those who make use of this method. They will also probably multiply the resources of the rhinothepautic pharmacy, and thereby add to the success and certainty of this interesting method of treatment.

DESCRIPTION OF APPARATUS FOR TREATMENT OF
DISEASES OF THE THROAT AND LUNGS
 BY MEANS OF ATOMIZED MEDICATED LIQUIDS.

DIRECTIONS FOR USING ACCOMPANY EACH OF THE DIFFERENT FORMS
 OF APPARATUS.

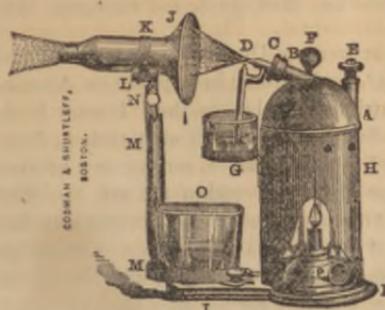


Fig. 15.

Fig. 15. *The Complete Steam Atomizer* (patented). The name *complete* is used in connection with this apparatus with particular reference to the *quality of its performance*, as under no circumstances does it throw out little jets of hot water to frighten or scald the patient. The word is also appropriate when used to describe the apparatus itself, as it is the result of much care in arrangement, and of expense in the machinery employed for its construction. On account

of its convenience, durability, portability, compactness, and cheapness (in the best sense of the word), we think it adapted to come into almost universal use by physicians for their patients, and by patients at their homes.

It consists of the sphere-shaped brass boiler *A*, steam outlet tube *B*, with packing-box *C* formed to receive rubber packing through which the atomizing tube *D* passes, steam tight, and by means of which tubes of various sizes may be tightly held against any force of steam by screwing down its cover while the packing is warm; the safety-valve *E*, capable of graduation for high or low pressure by the spring and screw in its top, the non-conducting handle *F*, by which the boiler may be lifted while hot, the medicament-cup and cup-holder *G*, the support *H*, base *I I*, the glass face-shield *J*, with oval mouth-piece connected by the elastic band *K* with the cradle *L*, whose slotted staff passes into a slot in the shield-stand *M M*, where it may be fixed at any height or angle required by the milled screw *N*.

The shield-stand is formed into a handle just above the waste-cup *O*, and its base is formed to receive and hold this cup. It has also a sliding arrangement and set-screw, by which it may be fixed any desired distance from the atomizing tubes.

The boiler is supplied with water through the opening into which the safety-valve is screwed.

All of its joints are hard soldered, and cannot be separated by any heat short of redness or any pressure attainable with the lamp. Every one is carefully tested by very high steam pressure, and no accidents can happen to frighten the patient or injure the apparatus, should the water in the boiler become entirely exhausted.

The spirit-lamp *P* is of brass, and is provided with means of graduating the flame, and with an extinguisher.

The waste-cup, medicament-cup, and lamp, are held in their places in such a manner that they cannot fall out when the apparatus is carried or used

over a bed or otherwise. The apparatus is contained in a box $7\frac{1}{2} \times 4 \times 8$ inches; it can be carried from place to place by the practitioner without removing the atomizing tubes or the water; it can be unpacked and put in position for use in one minute, and repacked in the box in as short a time.

Price of this Apparatus as represented in the cut, including two Glass Atomizing Tubes, extra packings, and Shield Band, with directions for using, packed in box for transportation \$8.00
In neatly made, strong, Black Walnut box, with handle, additional 2.50
Extra Face Shields, any size, including Elastic Band, each50
Glass Atomizing Tubes, each, 50 cts.; Silver do., \$2.00; Silver and Platinum, 5.00



Fig. 2.

Fig. 2 represents Dr. H. K. OLIVER'S *Hand Instrument*, as described in a paper on Atomization, contributed by him to the "Boston Medical and Surgical Journal" of March 8, 1866. A, Elastic Bulb with Valves, serving as a bellows to produce the spray within the jar. B, The Bergson Atomizing Tubes, the upright arm being formed in part by a rubber tube, which dips into the medicament placed in the bottom of the jar. C, Opening for the admission of air.

In this instrument the receptacle for the medicament and the shield for the protection of the face are united in one piece, while the spray is rendered exceedingly fine by being thrown forcibly against the side of the jar.

Price, with two Atomizing Tubes, securely packed, accompanied with directions for using, \$4.00. Price of Atomizing Tubes alone, 50 cents each. With Double Bulbs, instead of a Single one, \$5.50.

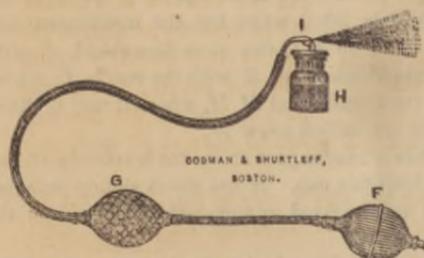


Fig. 3.

The Apparatus represented in Fig. 3 is essentially the same in form as that of Dr. ANDREW CLARKE, of England, but of improved construction. It consists of the Elastic Bulb F, which, with its valves, serves to force air into the Elastic Chamber G, which, alternately expanding and contracting, supplies a steady stream of air to the Atomizing Tubes I, one branch of which dips into the vial containing the medicament. The stopper is of elastic rubber (patented), and fits perfectly the atomizing tubes and the vial. In addition to its other uses, this instrument constitutes a perfect Douche for bathing and making medicinal applications to burns, sensitive eyes, inflamed surfaces, painful sores, and for perfuming or disinfecting the sick-room.

Price, with two Glass Atomizing Tubes, securely packed, \$4.00. Price of Atomizing Tubes alone, 50 cents each. When of Silver, \$2.00; when of Silver and Platina, \$5.00.

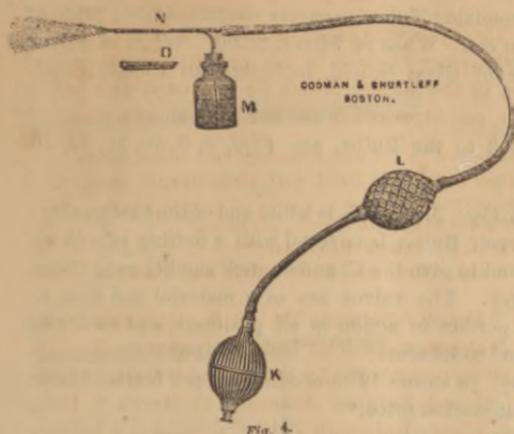


Fig. 4.

Fig. 4. Freezing Apparatus for producing Local Anæsthesia.

This form of apparatus — similar to that represented in Fig. 3, with exception of Atomizing Tubes, which are of metal,—is all that is required for producing Local Anæsthesia by freezing with Ether, as employed by Dr. RICHARDSON, of London, or with Rhigolene, as de-

scribed by Dr. H. J. BIGELOW, of Boston, in the "Boston Medical and Surgical Journal" of April 19, 1866.

The Metallic Tubes which accompany this Apparatus are equally efficient for inhaling purposes, except for liquids liable to be vitiated by contact with metal, for which glass or silver, or silver and platinum tubes should be used. Price of Apparatus, with Silver Plated Freezing Tubes, \$5.00. Price, with two Glass Bergson Atomizing Tubes, and vial (fitted), thus combining in one the two apparatus for freezing and atomizing, represented in Figs. 3 and 4, \$6.00. Price of Silver Plated Freezing Tubes alone, \$2.00.

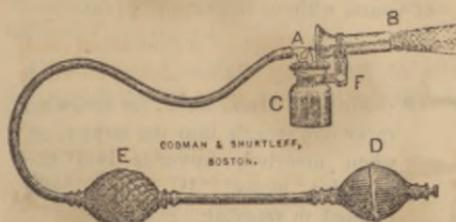


Fig. 5.

Fig. 5 represents SHURTLEFF'S Atomizing Apparatus, (patented). It is similar to Dr. Clarke's (Fig. 3), but has the shield B in addition. When used for inhalation the end of the shield is taken into the mouth, and serves both to protect the face and

to depress the tongue, so that a direct and powerful current of spray may reach the throat.

For making external applications the shield may be used to direct the spray upon a small surface only, or it may be disconnected, and the apparatus used without it.

As all superfluous spray is turned to liquid by striking the inner walls of the shield, and is returned again to the vial by a suitably-formed orifice through the rubber stopper, this apparatus is very economical of the medicament,—a matter of some importance, when expensive liquids are employed.

Extra shields of uniform or of various sizes will be furnished, if required, and can be connected with the other part of the apparatus without loss of time by passing them into the elastic rubber band which secures them to the upright standard.

At F is a joint controlled by a thumb screw on which the shield swings when the vial is filled or emptied.

Price, with two Glass Atomizing Tubes, securely packed, \$4.50; price of Atomizing Tubes alone, 50 cts. When of Silver, \$2.00. When of Silver and Platina, \$5.00. Price of Glass Shield, including an Elastic Band, each 25 cents.

(For other Tubes adapted to the Bulbs, see *Figs. 8, 9, 10, 11, 12, 13* and 14.)

The rubber of Apparatus, *Figs. 3, 4* and 5, is white and of the best quality. The Air Chamber or Reservoir Bulb *L* is covered with a netting of silk to prevent undue expansion, and to give the Chamber such rigidity as to afford a powerful current of spray. The valves are of a material and form to render them uniform and perfect in action in all positions, and each one is carefully fitted and ground to its seat.

Rhigolene, of best quality, in strong 12-ounce bottles, per bottle, \$1.00. Ether, of suitable quality, at market price.*

Tubes adapted to Bulbs represented in Figures 3, 4, and 5.

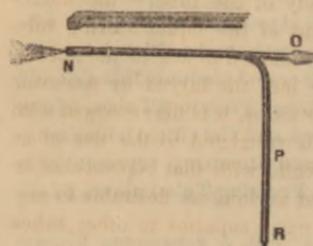


Fig. 8.

o and *r*, (*Figs. 8* and *9*), conical end of air Tube for connecting with the rubber Tube of the Bulbs.
n and *o*, (*Figs. 8* and *9*), Regulator (patented) for controlling the quantity and quality of the spray.

Fig. 8. The Silver Plated Freezing Tube usually furnished with the Apparatus, *Fig. 4*. Price, with Regulator, \$2.00; when of Silver, \$4.00; and when of Glass, without Regulator, \$1.00.

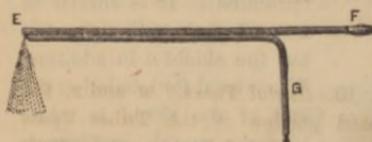


Fig. 9.

Fig. 9. Metal Tube, for throwing spray downwards into the larynx, or, when inverted, upwards into the posterior nares. It is also well adapted to freezing.

Price, Silver Plated, with Regulator, \$2.00; when of Silver, with Regulator, \$5.00; when of Silver and Platina, with Regulator, \$12.00.

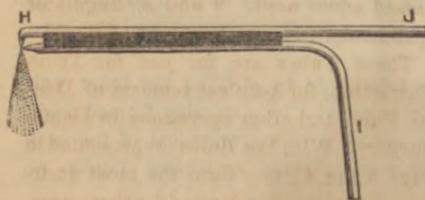


Fig. 13.

Figure 13. Glass Tube, for throwing spray downwards into the larynx or, when inverted, upwards into the posterior nares.

Price, without regulator, \$1.

*NOTE.—Experience during the time in which Rhigolene and Ether have both been used for Local Anæsthesia, seems to have decided that Rhigolene is preferable to Ether, as being much quicker in action and more economical on account of lesser first cost, and smaller quantity required. Fears entertained, at first, of danger from its supposed great inflammability, have not been, we believe, in any instance realized.

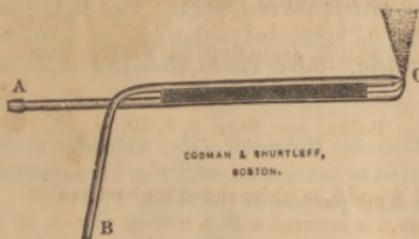


Fig. 14.

Figure 14. Glass Tube, for throwing spray upwards through the posterior nares.

Price, without regulator, \$1.00.

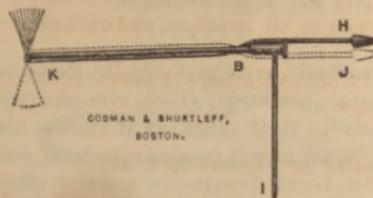


Fig. 11.

Fig. 11 represents a very useful (patented) modification of the tube Fig. 9. By means of a nicely-made joint at B, the horizontal part may be turned to throw spray up or down, or in any direction at a right angle to the body of the tube,—the induction end of the liquid-bearing tube

being always downwards. It is particularly adapted to use in the throat, as the spray may be readily directed, either into the larynx or posterior nares. When Fig. 9 is used for the posterior nares, it is first charged with liquid and then inverted, and the operator is restricted to the use of as much liquid only as the tube will contain; while with that represented in Fig. 11 the current of spray may be continued as long as desirable in any direction. This quality renders it in some cases superior to other tubes for Local Anæsthesia.

Price, Silver Plated, with Regulator, \$3.00; Silver, with Regulator, \$6.00; Silver and Platina, with Regulator, \$15.00.

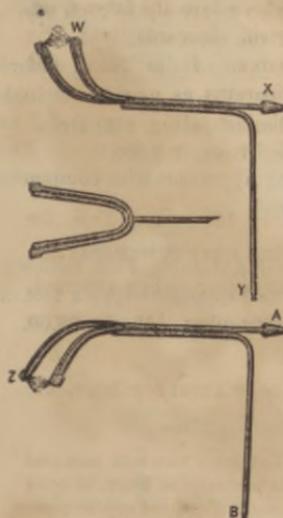


Fig. 10.

Fig. 10. Dental Tubes. w and z, the bifurcated portion of the Tubes (patented), designed to deliver spray on both sides of the gum at the same moment. x and A, conical end of air Tube over which the rubber Tube of the bulbs is passed when used. y and B, Regulator (patented), to control amount of liquid.

These Tubes are for use for Teeth Extraction, for painless removal of Dental Pulp, and other operations in Dental Surgery. With the Bulbs (represented in Figs. 3 and 4) they form the most desirable Apparatus yet devised for these uses. For testimony in regard to the value of this Apparatus, see p. 26.

PRICES. — Either of those represented in Fig. 10 (one being for use for Superior and the other for Inferior Teeth), Silver Plated, with Regulator \$3.00; the

two, \$6.00; when of Silver, either, \$6.00; the two, \$12.00. One Bifurcated Tube, for use for either jaw, having the bifurcated portion straight instead of curved, and therefore not as convenient,—Silver Plated, \$3.00; Silver, \$6.00.

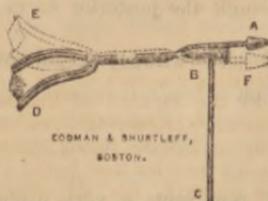


Fig. 12.

Reversible Bifurcated Tube, with joint as described in connection with Fig. 11, answering the same purpose as the two in Fig. 10.

Price, Silver Plated, with Regulator, \$5.00; Silver, with Regulator, \$10.00.

To all the Metal Tubes, for Local Anæsthesia, as suggested by Dr. BIGELOW and others, we have attached a Regulator (patented), which, without materially increasing the cost, adds greatly to their value, as it enables the operator to secure such an amount of liquid as will freeze in the least possible time when the Tubes are used for Local Anæsthesia, and will afford the finest spray when used for inhalation. It is also very useful in preventing the passage of foreign substances into the Tubes. Many Silver and other Metallic Tubes are so made as to be nearly worthless on account of the manner in which the orifices are formed, and of the unsubstantial method of joining the two branches. Those of our manufacture have orifices formed in solid metal turned and drilled in a lathe, and the two branches are soldered firmly together in immediate contact, or connected by double braces for those formed on a right angle. Those described as Silver, or as Silver and Platinum, are made in the same manner; the latter have both Nozzles and the liquid-bearing Tube of Platinum, and are therefore not liable to be acted upon by any liquid. All our Glass Tubes are well annealed and remarkably strong. The two branches are so united that they cannot possibly get into a wrong position relatively to each other, and therefore always work well in the hands of the most unskilled.

The price of the double Bulbs being \$3.00, any of the Tubes before described may be selected to form such an Apparatus as may be desired, and the price readily ascertained. The Bulbs are also very useful as Inflators for Pessaries, Barnes' Dilators, and for other purposes. For extensive operations, we make a larger Freezing Apparatus with compound jets, which we will describe, if desired, by letter.

Foot Bellows. We make a neat, substantial and durable Foot Bellows, with elastic air chamber, covered with netting, and supplied with six feet of tubing. It may be used with any of the atomizing tubes. Price, \$8.00.

DESCRIPTION OF APPARATUS FOR TREATING
DISEASES OF NASAL PASSAGES,

BY THE METHOD OF DR. THUDICHUM.



Fig. 6.

Fig. 6. Nasal Douche, or Apparatus for treating diseases of the Nasal Cavity, by the method of Professor THUDICHUM. A, Reservoir. B, Leading Tube. C, Nozzle, fitting the nostril in such a manner that liquid cannot pass outward, nor air into the nostril. D, Joint formed by inserting a short glass Tube within the rubber tubing, at which Nozzles of different sizes, or for different patients, may be connected without loss of time. Price, with two Nozzles, securely packed, \$2.50; extra Nozzles, each, 25 cents.

"*Cheap Nasal Douche,*" similar to *Fig. 6.* Price, with two Nozzles, securely packed, \$2.00; Extra Nozzles, each, 25 cents.

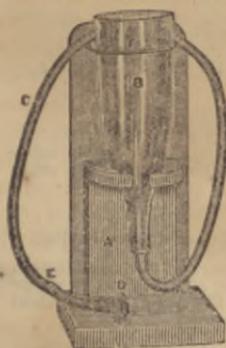


Fig. 7.

Fig. 7. Dr. Oliver's form of Apparatus for Nasal Douche, designed for office use. A, Black-walnut Stand. B, Conical Reservoir. C, Leading Tube. D, Nozzle. E, Joint. F, Ring, hinged to Stand, to support the Reservoir.

Price, with two Nozzles, packed for transportation, \$3.50; extra Nozzles, any size, each, 25 cents.

In using either kind of Douche described, the Reservoir is placed higher than the head, and the rubber Tube is grasped near the Nozzle, between the thumb and finger, so as to control the current. The Nozzle is then depressed enough to allow a little of the liquid to escape, thereby expelling air from the Tube. It is then pressed gently into the nostril, and the grasp slightly relaxed, when the current will enter and fill the whole cavity of the nose and escape by the opposite nostril, the head at this time being thrown slightly forward over a basin, and the mouth kept open.

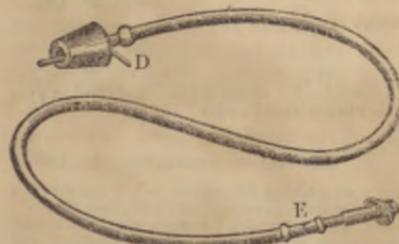


Fig. 16.

Allen's Nasal Douche. Instead of the reservoir furnished with other forms of Douche, this has a stopper, so made, that when inserted into a bottle of suitable size, such as can be found in every house, and the bottle inverted, the liquid will pass down the tube while air enters through another smaller tube in such a way as to form no interruption to the egress of the liquid.

On account of its cheapness and portability, it will be found a desirable form of the Douche.

Price, with 24-inch tube and one nozzle of best form, \$1.20; with 36-inch tube, \$1.50
Also, Traveller's Nasal Douche and Syphon Douche, each . . . 1.50 to 2.00

We also make little Stop-cocks of hard rubber, which are thought by some to add to the value of the Douche. If required, they are inserted in the Tube at the joints D or E. Price, additional, \$1.75.

It will be noticed that the forms of Apparatus represented in *Figs. 6 and 7*, though different in detail from those described by Prof. THUDICHUM, are the same in principle. Though very simple, and comparatively inexpensive, we know, both from observation and report, that they answer perfectly the purpose intended.

Directions for using accompany each of the different forms of Douche Apparatus.

OPINIONS OF PHYSICIANS AND SURGEONS.

BOSTON, May 2, 1866.

GENTLEMEN,—I have used the three kinds of Apparatus for Nebulizing, prepared by you, and I have found them perfectly safe in their arrangements, and useful for throat and lung complaints.

Yours, respectfully,

H. I. BOWDITCH.

18, ARLINGTON ST., BOSTON, May 11, 1866.

MESSRS. CODMAN & SHURTLEFF: *Gentlemen*.—Your Steam Atomizing Apparatus furnishes an easy and valuable method of making local application to the fauces, larynx, and lungs.

EDW. H. CLARKE.

The following is an extract from a note from Dr. HENRY J. BIGELOW:—

"I have thus far found nothing better for freezing with Rhigolene than the tubes made by you after the pattern I gave you, and which I still use with your other apparatus."

BOSTON, May 16, 1866.

MESSRS. CODMAN & SHURTLEFF: *Gentlemen*.—Your Apparatus for Atomization of Liquids seems to have been carefully made, and I think it an efficient one where required for treatment of diseases of the Throat and Lungs. The Apparatus for Local Anæsthesia which you made for me answers the purpose perfectly.

I am, very truly, your obedient servant,

J. MASON WARREN.

I have just had occasion to use one of your Apparatus for Local Anæsthesia, and it acted like magic. It is just the thing for Minor Surgery.

APRIL 29, 1867.

I have thoroughly tested the Narcotic Spray Apparatus you sent me on trial, and believe it to be the best of any I have seen.

I have been using one of your Steam Apparatus for about a year, and find it perfectly adapted for treating all diseases of the Throat and Lungs.

GALVESTON, Texas, Sept. 27, 1867.

GENTLEMEN,—I see that the impression prevails that Rhigolene is not suited to a warm climate, because it is *thought* that it boils at a temperature of 70 degrees F.

The article which you sent me in January, and of which I have a small quantity remaining, I know has been subjected to 90 degrees, and often more, this summer, yet it has not lost in the least any of its efficiency.

It produces congelation of the tissues where applied, almost instantly, and with an exceedingly small quantity. I am delighted with it, as well as with the excellent apparatus of Dr. Bigelow. It robs minor operations of all their terrors, entirely preventing pain; and this is a great consideration in an operation.

I have ventured to freeze parts where the vitality is low, and never yet have I experienced the slightest trouble as to any secondary effects.

* "It seems to me a singularly convenient and useful one."

* "In completeness, elegance, and adaptability to the purpose for which it is designed, it is I think superior to any other 'Steamer' in use."

* "The little apparatus is the most complete for its price than any that have yet been manufactured, and the retail price so low, that expense is no longer an impediment to its employment by patients."

From *Philadelphia Medical and Surgical Reporter* of Nov. 28th, 1868:—

* "Our Boston friends, Messrs. CODMAN & SHURTLEFF, have favored us with another modification of their model atomizer, and we must say that it is an elegant instrument, and sufficiently cheap to bring it within the reach of every practising physician in the country; and their energy in this direction, in popularizing such useful apparatus, deserves commendation."

From *Boston Medical and Surgical Journal* of Nov. 26th, 1868:—

* "We have received from the makers, Messrs. CODMAN & SHURTLEFF, a new instrument for using atomized fluids, which appears to be very complete, simple, and durable. The inventors claim that it cannot explode, unsolder, nor throw hot water jets instead of vapor."

"If its future use warrants the expectations its appearance would lead us to form of it, it will prove very popular and very useful."

"For its thorough work and durability, the price is very reasonable."

* "Its operation is complete and satisfactory, and the ingenuity and artistic skill displayed in the design and manufacture, is a success truly."

* "I have not seen anything, either in workmanship or convenience, which surpasses it, and shall take great pleasure in recommending it as an admirable instrument."

* "It seems to be as near perfect as such a machine can be, and I have no doubt will be much sought for by the profession."

From the *New England Medical Gazette* of January, 1869:—

"The 'Complete Steam Atomizer,' as arranged by CODMAN & SHURTLEFF, seems the ultimatum of convenience, durability, portability, and compactness for the purpose intended; and as to cheapness, we do not see how so perfect and extensive a piece of machinery can be made for six dollars."

"Wherever frequent and continued medical inhalation is employed, this apparatus is invaluable."

"Their Hand Atomizer, for local application, is one which no physician should be without."

* "It is the best constructed apparatus of the kind I have examined."

"Your efforts in the practical atomization of remedies, are largely advancing this valuable means of treatment."

MASSACHUSETTS GENERAL HOSPITAL,

BOSTON, February 15, 1869.

CODMAN & SHURTLEFF'S Complete Steam Atomizer has been used in the wards of the Massachusetts General Hospital since its introduction. It is perfectly simple in its construction, yet substantial, compact, and safe. It atomizes steadily and completely, and gives entire satisfaction.

BENJ. S. SHAW, M. D.

Resident Physician and Superintendent.

OPINIONS OF DENTISTS,

Who have used the Freezing Apparatus for their branch of Surgery.

The Apparatus for Dentists' use was referred to by Dr. STELLWAGEN, at a meeting of the Pennsylvania Odontographic Society, reported on p. 316 of *Dental Cosmos*, for January, 1867, as follows:—

"Dr. STELLWAGEN then exhibited a Spray producer, of American Manufacture, having the tubes for the liquid and the air distinct and separate, which he thought made a more perfect Spray than the English Instrument, and with less Ether.

"These Instruments have been employed with marked success in the Dental and Surgical Clinics of the Philadelphia Dental College."

"I received the Instrument you sent, and it has proven all I could ask."

PHILADELPHIA, Jan. 24, 1867.

"MESSRS. CODMAN & SHURTLEFF.—I inform you with pleasure that the Spray Apparatus of American manufacture, mentioned in the *Cosmos* of January, as brought before the Odontographic Society of this city, is of your manufacture, and has, within my own observation, been used by many, with very happy results."

"It is very satisfactory The Double Tube is much superior to one I saw from * * * I wish you would send me another."

"As I think I have given it a fair trial, I feel bound, in justice to its merits, and to my professional brethren, to add my testimony in its approval. The Tube which you let me have about two months ago (with regulating screw), I find to be an improvement."

"Your Apparatus for Local Anæsthesia, which we ordered some time ago, answers the purpose to our perfect satisfaction."

P O S T A G E .

THE following will be sent by Mail, if so ordered, providing the amount necessary for prepayment of postage accompanies the order in addition to the price:—

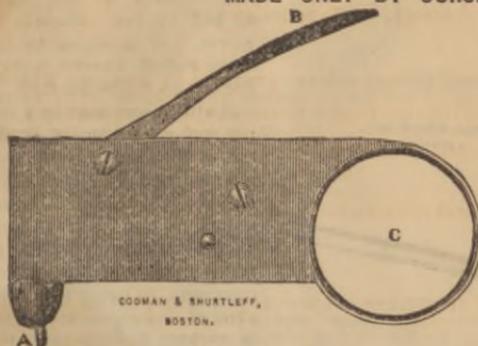
	<i>Postage—Cents.</i>
Apparatus, Fig. 3, complete . . . . .	.87
Apparatus, Fig. 4, complete . . . . .	.84
Combined Apparatus, Figs. 3 and 4, complete	1.05
Apparatus, Fig. 5, complete	1.00
Dentists' Apparatus, consisting of bulbs, vial, and the 2 tubes represented in Fig. 10 . . . . .	.90
One Glass, Silver, or Silver and Platinum Tubes, for Apparatus Fig. 1 or for Fig. 15 . . . . .	.09
Two Glass Tubes for Fig. 1 or for Fig. 15 . . . . .	.12
One or Two Glass Tubes for Fig. 2 . . . . .	.06
One Glass, Silver, or Silver and Platinum Tubes, for Fig. 3, or Fig. 5 . . . . .	.06
Two Glass Tubes for Fig. 3, or Fig. 5 . . . . .	.09
Silver, Silver-Plated, or Silver and Platinum Tubes, for Fig. 4, (also shown in Fig. 8) . . . . .	.12
Silver, Silver-Plated, or Silver and Platinum Tubes, Figs. 9 and 11 . . . . .	.12
Dental Tubes, — either of those described in Figs. 10 and 12 . . . . .	.15
The two described in Fig. 10 . . . . .	.21
One or two Nozzles for either kind of Douche, Figs. 6, 7, and 16 . . . . .	.06
Three or four Nozzles for either kind of Douche, Figs. 6, 7, and 16 . . . . .	.09

THE AUTOMATIC VACCINATOR.

[WHITTEMORE'S PATENT.]

FOR USING THE CRUST.

MADE ONLY BY OURSELVES.



A. Perforator having its end counter-sunk or hollowed to receive a small quantity of the crust.

In using the Instrument, the forefinger is passed into the Ring C, and the thumb pressed upon the Lever B, by which the perforator is raised, and after reaching a certain height is disengaged by the proper mechanism, when it descends with the force of the spring, and, slightly puncturing the skin, deposits the virus.

A single, easy motion in one direction, is all that is required to operate the Instrument,—the skin being punctured and the matter deposited simultaneously.

The pain attending its use is so slight as rarely to waken a sleeping child, while the operation is rendered much more certain than by other methods.

SENT (POST-PAID) ON RECEIPT OF

Price, \$4.00. Every one Warranted.

The following, from sources that will be generally recognized and respected, is the only testimony we think it necessary here to present.

I have examined and used the Improved Vaccinator, which you were so kind as to send me.

With a very long and extended knowledge and experience of the various methods of Vaccination, and the instruments employed in the performance of that simple operation, I do not hesitate to say, that your Vaccinator is the best, and that with it, any one, without special dexterity, can vaccinate with great rapidity and certainty, and, as is of great importance, do a great deal of work in a short time.

Yours truly,

HENRY A. MARTIN, M.D.

TAUNTON LUNATIC HOSPITAL, June 30, 1867.

I cannot speak too highly of your Vaccinator.

I always charge it with a paste made of the powdered crust with Glycerine, which keeps perfectly well.

DR. NORTON FOLSOM.

VACCINE VIRUS always on hand and sent by return train in answer to orders by mail or telegraph.

We are able to supply Physicians and the Trade with Vaccine Virus of absolute purity and excellence.

The Lymph we have furnished for the last four years has given such satisfaction, that we now offer it with the renewed and complete assurance, that no better service can be offered than that performed in this branch of our business.

TERMS.

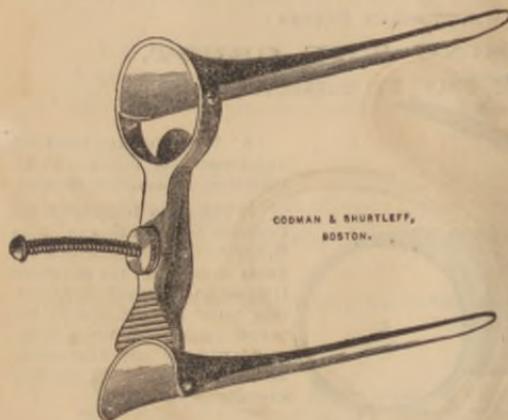
VACCINE CRUSTS, resulting from the desiccation of perfect, unruptured vesicles, carefully selected and securely mounted in Gutta Percha, so as to be used without breakage or waste, \$3.00 each.

QUILL POINTS, prepared so that the Lymph cannot chip off, well and carefully charged, in packages of ten points, \$1.50 per package.

Each package of Virus will be hermetically sealed, and packed very securely for preservation and easy transmission by mail, or otherwise, to any distance, and is absolutely warranted.

Whenever its use fails to give perfect satisfaction, a fresh supply will be sent, on notification, within fifteen days.

THE STORER SPECULUM.



THE accompanying cuts represent an important improvement upon any form of Speculum hitherto in use, lately devised by Prof. Horatio R. Storer, and exhibited by him to the Suffolk District Medical Society, on September 26th.

It will be seen that by a simple spring attachment at the side of the Cusco bivalve, (represented at A,) the blades may at once be disjoined, swung around back to back, and there fixed by a turn of the nut already existing upon the screw traversing the handles, with the effect of giving a retractor equal in working facilities to that of Sims'.

Dr. Storer's instrument is, in fact, a duplex one: as a speculum retaining the excellence of Cusco's instrument, and as a retractor better for ordinary purposes than the complicated and more expensive instruments of Emmet, Bozeman, Pallen, and Bryant.

The history of the invention, may be given in Dr. Storer's own language, when describing it to the Society.

"A year ago I was discussing with my assistant, Dr. Stone, the features of Dr. Thomas' Telescopic Speculum, and remarked to him that while I was averse to the unnecessary multiplication of instruments, I thought it possible to improve upon the best yet in use, which I considered Cusco's to be.

Some six months afterwards I had occasion to remove stitches from the anterior vaginal wall, after an operation for vesical fistula, and happened to have no retractor with me. I therefore directed Dr. Stone to remove the screws connecting together the blades of Cusco's instrument, and by reversing their relative position I had at once the retractor that I desired. By subsequently attaching a moveable spring peg in place of one of the screws, and rendering the other one a fixed point, immediate change from the speculum to the retractor, and back again, became possible by a slight touch of the finger."

This instrument, (many of which have already been sold,) is of our own manufacture; and from its combining the advantages of two separate and distinct mechanical principles, and thus making one instrument serve the purposes of two, will probably come into almost universal use. It has been styled by Dr. Storer the "Boston Speculum," but will doubtless be known by his own name. **Price, \$7.00.**

Dr. Storer's other instruments — his intra-uterine Scarificator, clamp-shield, of great value in ovariectomy and removal of the uterus by abdominal section, porte-caustique for intra-uterine applications, hollow needle with jointed handle, wire rope for ecraseur, pessary for retroflexion, prolapsed ovary and tumors in Douglas's fossa, may also be obtained of us.

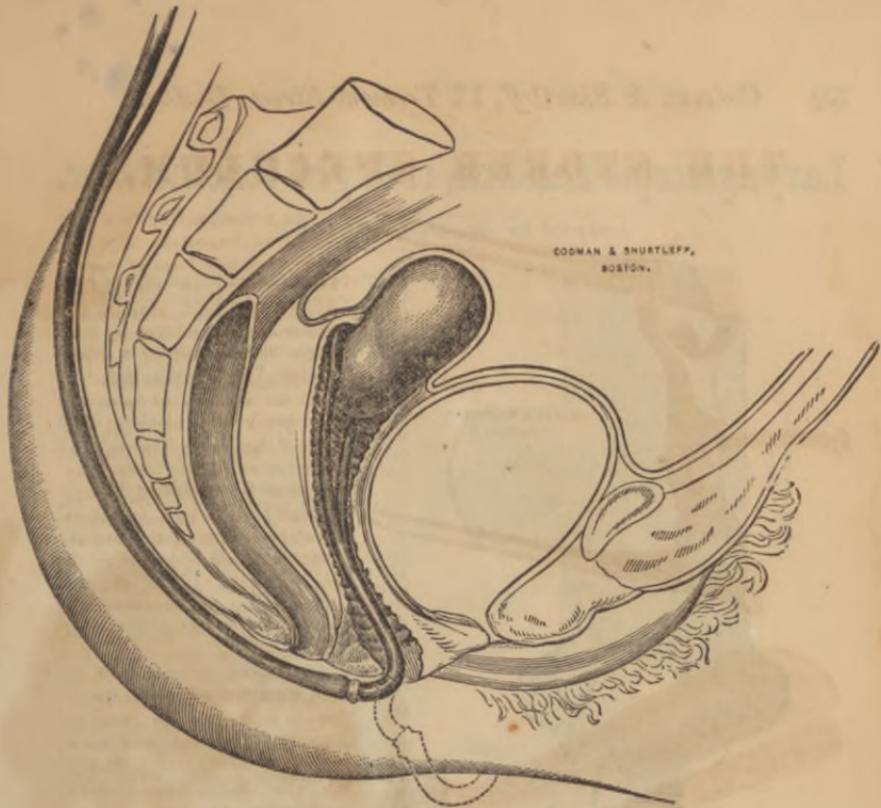


Fig. 1.

**DR. E. CUTTER'S
PESSARY, FOR RETROVERSION OF THE UTERUS.**

THE modification in this Pessary consists in the single posterior support,—the hooked termination and the joint. It operates as follows:—

Extending the vagina in its long diameter, and in the direction of its antero-posterior curvature, it does not distend it transversely, nor interfere with the normal tonic contraction of its transverse fibres; in which condition of the vagina there can be no retroverting of the uterus.

Its fixed point, by means of the elastic suspension, is the sacrum, and not the vaginal or pelvis walls. The suspension imitates the natural elasticity of the normal uterine supports, and permits a limited degree of motion. The suspension cord runs in the furrow between the buttocks, which prevents lateral motion of the Pessary. Motion upwards is prevented by the post-utero vaginal cul de sac; downwards, by the suspension; forwards, by the cervix uteri, and backwards by the promontory of the sacrum.

The joint, in the crook obviates the necessity of removing the belt,—permitting the tubing to be turned aside during defecation, at the same time serving as a handle, by means of which the vagina may be kept at its normal length, and the uterus in situ naturalis during the bearing-down efforts, which, under other circumstances, are likely to retrovert a replaced womb.

There are three sizes of the Pessary,—4½, 5, and 6 inches in length.

Price of either size, with directions for introducing \$3.00

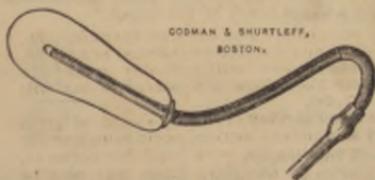


Fig. 2.



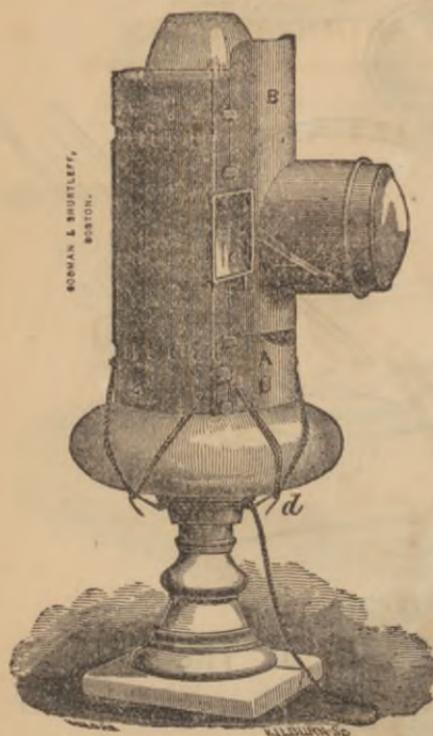
Fig. 3.

Figures 2 and 3 represent, respectively, an Intra-Uterine, and a Prolapsus Pessary, which combine, with the usual features of such instruments, the advantages of convenient external support, and of the jointed hook, as in the other instrument.

Price of either \$3.00

Laryngoscopic Lantern, or Light Concentrator.

Invented by Dr. H. K. OLIVER.



THIS is, as far as we know, the only LARYNGOSCOPIC LANTERN made in the United States,—those in use here being all imported from Europe. To nearly all of these instruments there is the objection that they are adapted to a particular kind of lamp or gas fixture. The invention of Dr. OLIVER obviates this objection,—his Lantern being, by a number of very simple contrivances, easily fitted to any kind of lamp or fixture.

The want of a portable Light Concentrator, of universal adaptability, has been greatly felt by Laryngoscopists when called upon to examine cases away from their office. It has also, as we know from personal experience, obstructed the desirable extension of the study and practice of laryngoscopy, inasmuch as general practitioners and students have found it necessary, in order to provide themselves with a Light Concentrator, to purchase also the fixture or lamp to which it was attached.

Dr. OLIVER's Instrument is designed for direct light,—a method preferred by many Laryngoscopists to reflected light. The lens, however, is of sufficient diameter for use with the frontal reflector, if thought desirable.

Auto-laryngoscopy being by general acknowledgment an important means of acquiring skill in the use of the laryngoscope, there is attached to the Lantern a small mirror, which, by a very simple mechanism, has nearly all the movements usually afforded by the ball and socket joint.

This Light Concentrator will be found useful not only in laryngoscopy, but in the examination of the external ear.

In the same box in which the Lantern is packed, is a rack for three sizes of laryngeal mirrors, copied from London mirrors imported by Dr. OLIVER, with which they bear favorable comparison.

Description.—The Lantern is made up of three main portions, the front piece A, and two wings which hinge upon the front piece, and by which the diameter of the lantern may be increased beyond the diameter of any of the glass chimneys in ordinary use. These wings may be locked together at the desired point, as at *a, a*. The height of the flame from the part of the lamp suited for a support to the Lantern varies considerably, of course, in different lamps and gas stands; and inasmuch as the lens must be on a level with the flame, the tube containing it is attached to a slide B, which, moving in grooves in the front main piece, may be raised or lowered, as found necessary. The lens is also movable within the tube, in order to admit of its being retained at its focal distance from the flame, when the diameter of the Lantern is changed. The movement is made by the sliding of a knob on each side (*b*) in an elongated opening in the tube. The Lantern is made firm upon the lamp by passing a bit of cord back and forth between the instrument itself and hooks (*d*), which are strung upon a cord tied around any suitable place in the lower part of the lamp. This arrangement is simple, extremely efficient, and universally practicable,—the latter point being difficult of attainment by any other mechanism. At *c* is seen the little mirror for use in auto-laryngoscopy.

Price.—Laryngoscopic Lantern \$4 00
 Auto-Laryngoscopic Mirror, additional 1 00
 Set of three Laryngoscopic Mirrors 4 50

All the above fitted in Case 10 00
 Laryngeal Mirrors, separately, any size 1 50

 Concise rules for use furnished with each Instrument.

For full description of the Lantern and method of its employment, see article contributed to the *Boston Medical and Surgical Journal*, of October 8th, 1868, by Dr. OLIVER.

DR. CHAPMAN'S
Spinal and Lumbar Ice and Hot Water Bags,

For making dry, hot, or cold applications to the spine and other parts of the body.

THE DOUGLASS PATENT ARTIFICIAL LIMBS.

We have been appointed Agents for these very excellent Limbs, and will forward descriptive pamphlets, on application.

RUBBER URINALS,

For Males or Females.



Figure 1.

These Urinals
valves, which pre-
with tightly closing
of the greatest ser-
flicted with incon-
They are adapted
on the person, and



Figure 2.

are provided with
vent overflow; also
stop-cocks, and are
vice for persons af-
tinance of urine.
for constant wear
are quite durable.

PRICES.

Male, for day or night,	\$6.00
Male, for day only (Figure 1),	5.00
Female, for day only (Figure 2),	4.00

FACTORY.

We have over and connected with our Store, a Factory, with steam-power, where instruments of every description are made to order, or sharpened, polished and repaired, and where old instruments may often be rendered nearly as good as new.

TRUSSES, FOR ADULTS.

Ball and Socket, hard or soft Pads	single,	\$4.00
“ “ “ “	double,	7.00
Ratchet, hard or soft Pad	single,	4.00
“ “ “ “	double,	7.00
Spiral-Spring Pad	single,	4.00
“ “ “ “	double,	7.00
French Style, or long Pad	single,	4.00
“ “ “ “	double,	7.00
L. B. White's Patent Lever, hard Pads	single,	\$7.00 to 10.00
“ “ “ “ “ “	double,	10.00 to 20.00
Hard Rubber	single,	8.00
“ “ “ “	double,	10.00
Moc-main or Varicocele		
Trusses for Prolapsus Ani		
Dr. Banning's, with separate attachments, for either kind of Hernia or Prolapsus, and for spinal and abdominal support,		\$10.00 to 20.00

CHILDREN AND YOUTHS' TRUSSES

Ratchet, hard or soft Pads	single	\$3.00
“ “ “ “	double,	5.00
French, soft Pads	single,	3.00
“ “ “ “	double,	5.00
“ cheap style, soft Pads	single,	2.00
“ “ “ “	double,	3.00

UMBILICAL TRUSSES AND BELTS.

Umbilical Trusses		\$5.00
“ Belts, with adjustable Pads		5.00
“ “ Children's		2.50

ABDOMINAL SUPPORTERS.

Chapin's		\$4.00
Boston		4.00
London		5.00
Philadelphia, with pads giving support on lateral muscles		7.00
Fitch's		4.00
Banning's, with attachment for either kind, for Hernia, or for Prolapsus Uteri, Prolapsus Ani, or Spinal Curvature		
Mrs. Betts', with Prolapsus Pad		7.00

The above-described Trusses and Supporters are nearly all of our own manufacture, and will be found of the first class as regards quality, adaptation, and workmanship. The prices are those for which we adapt them to the patient. Physicians sending measures, and taking the trouble and responsibility of fitting patients, will receive them at a discount of 33 $\frac{1}{3}$ per cent. from these prices.

SILK ELASTIC ABDOMINAL BELTS.

For use during pregnancy, and when abdominal support is required, \$10.00

SPINAL SUPPORTERS.

All kinds of apparatus for club feet, weak ankles, bow legs, malformations, &c., made to order to meet requirements of each case.

Shoulder Braces, Suspensory Bandages, &c., &c.

32 DIRECTIONS for measuring for Trusses, Supporters, Crutches, Apparatus for Deformities, &c., will be sent, if requested.

ELASTIC HOSE.



DIRECTIONS FOR MEASURING.

☞ Indicate the measure *around the limb* in inches, opposite the dotted lines of the cut.

For Stocking to cover the entire limb, measure at A B C E G H.

For Stocking to reach to G, measure at A B C E G.

For Stocking to reach to D, measure at A B C D.

For Knee-cap, measure at D E F.

For length of Stocking, measure from I upwards.

WE HAVE ALWAYS ON HAND

Sizes to reach to H—
Of best Silk.
Of Cotton.

To reach to G—
Of best Silk.
Of Cotton.

To reach to D—
Of best Silk.
Of medium Silk.
Of Cotton.

Sizes to reach from D to F
(Knee-caps)—

Of best Silk.
Of medium Silk.
Of Cotton.

To reach from A to B
(Anklets)—
Of best Silk (only).

Unusual sizes and forms for special cases made to order. Also, Elastic Abdominal Belts, for Obesity, Pregnancy, Weakness, &c.

Physicians ordering the above for patients, will receive them at a discount from retail prices.

Having a Factory, with steam-power and experienced workmen, we can promptly make to order, or sharpen and repair, Surgical and Dental instruments.

CODMAN & SHURTLEFF,

13 & 15 Tremont Street, Boston.

APPARATUS FOR PARACENTESIS THORACIS,

Approved by Dr. HENRY I. BOWDITCH,

Accompanied with Directions kindly furnished by him.

CAMMANN'S STETHOSCOPES, Articulated and Disarticulating,
OTOSCOPES.

LARYNGOSCOPES, simple Throat Mirrors.

OPHTHALMOSCOPES—Greefe's, Liebreich's, Anagnostakis's.

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