Inhalation of atomized fluids—its application to diseases of the Respiratory System—with cases.

Inhalation (from Latin: inhaleo, breathe in) is a method of applying medicaments to the Respiratory tract, whereby these substances being in a gaseous or atomized condition are brought into contact with the mucous membrane of the mouth, nose, pharynx, larynx & bronchi, & also even with the epithelial cells of the pulmonary alveoli.

Inhalation has been made use of as a mode of treating diseases of the Respiratory tract since the earliest times. Galen who lived in the early part of the 2nd Century used to send his Ptolemaic patients to the volcanic neighborhood of Mt. Vesuvius, where they could inhale the sulfurous fumes from the lava. They sat in the good effect of breathing the aroma from pine woods.

Oriëna, an Arabian Physician was in the habit of employing camphor for inhalation.
Hippocrates employed fumigations and inhalations of vapours, which must have been a primitive form of chemical therapy. He wrote, "Dvide suffitum illi en aceto, nitro, organum et mantuitii demine parato. Duce lateri tuta, pari aquae minima, ad acetum permuta et pane oleo instillato, macerato poste in ollam infusa, apperto arundine cava ridenta, mon prunis impoito ferens facito et ubi per arundinis fistulam susum vapor ascendens, eum aperto de intro trahat, ea cantione adhibita, se facies adamat. Interea, vero parte spongias aqua calida ridentas ad genas et manillas apponat."—"Iagui Hippocratu Opera Ommia, de Morbis," lib. II sec. V Geneve. 1657.

Paulus Aegyptus at the end of the 6th century advised the inhalation of the fumes from substances he caused to be thrown on live coals, the patient was made to breathe through a funnel.

Halp Abbas, an Arabian Physician.
is said to have used the volatile principles Camphor, &c. vinegar for inhalation. At various times volatile drugs such as Balsams of Benzoin, Gum Benzoin, Infused herbs, & sublimed minerals have been used in treating pulmonary complaints. Inhalation treatment of the present day is therefore not new, but a revival on an improved scale of an ancient practice.

It is said that the mucous membrane of the respiratory organs has a greater power of absorption than that of the stomach. Other advantages of inhalation are, that before absorption the medicament is not liable to be destroyed or neutralized by the action of the gastric ferments, also the substance inhaled comes into almost direct contact with the blood; there is also a more interference with the functions of the stomach by this method.
The mucous membrane itself, like any other external portion of the body, is also locally affected by the spray or atomized solution of drug. The mucous secretions may be enabled to be expelled with greater facility, the mucous membrane itself constricted or other-wise caused to cease producing the excessive secretion.

Spray treatment, or the method of treatment by atomization, differs from the ordinary method of inhalation by means of steam evolved from hot water.

Certain drugs which are the staple remedies for Bronchial diseases cannot be used at all when mixed with hot water; they are not vaporized with the steam, but remain behind in the mucus, it is as if the vegetable drug structures, those drugs which are naturally volatile that can be employed without water.
And they are often not of much use except in certain suitable conditions in the course of Bronchial complaints. With Atomization, sometimes called nebulization, however, any drug soluble in water can be used. The velocity with which the respiratory organs by means of their mucous membrane absorb is easily seen in the action of general anesthetics such as Chloroform or Ether etc. This rapidity of absorption can also be shown by swallowing into the stomach a certain amount of a narcotic or inhaling a like quantity by means of an atomizer when the amount required to produce the same effect will be left by the inhalation method. The success of the treatment by nebulization depends not only on selecting the proper remedy but also largely on the method used.
It has been said that the spray, or atomized fluid does not reach the lung itself, but is stopped by the pharynx (being there condensed) and does not pass the epiglottis, but various experiments instituted by the French Académie de Medicine conclude that the atomized fluid does reach the lung itself. Also in persons engaged in certain occupations with much dust, the fine dusty particles are found in the lung tissue where it sets up chronic disease, such as Anthracosis in colliers, siderosis in needlewomen, silica in stoneworkers etc.

Dr. Lewin in a work entitled "Die Inhalations-Therapie" relates a case where a patient was suddenly seized with Heemoptysis, Mathieu's Jerophege was at once used, the agent used was Spiritum ferris bisqueclati thirty drops in six ounces of distilled water with the result that the hemorrhage
was arrested, but the patient succumbed to the original disease of the lungs.

At the post-mortem, the blood in the lung was examined analytically; rim was found in much greater quantity than could be due to the blood alone. Seeing that the spray had entered the lungs.

Some of the methods of producing the atomization of medicines. It appears that Dr. Salles-Gibons of Pierre-Fonds in France was among the first to make an apparatus for the production of a spray for medicinal purposes. It was named "un pulvérisateur portatif des liquides medicamenteux." Dr. Salles-Gibons for this invention received a Silver medal from the Paris Academy.
This apparatus of Sales-Gourn was made by a Parisian Mechanician of the name of Charrière. The apparatus is figured below.

**Figure 1**

- a. Drum or cylinder in which the excess of spray is condensed.
- b. Manometer.
- c. Compression pump.
- d. Tube with stop-cock.
- e. Waste tube to carry off the condensed fluid.
- f. Reservoir. g. Stream of fluid about 0.04 to 0.05 of an inch on the drum. (a)
Sawles Green's instrument consists of a metallic vessel of the capacity of about twenty fluid ounces, this is filled two-thirds full of the liquid intended to be pulverised, in the neck of this vessel is screwed a condensing syringe which by compressing the air above the liquid, drives the latter through a capillary tube against a cone button in close proximity with such force that it is from that point deflected off in a fine spray. A manometer attached to the instrument shows the amount of pressure employed, the usual pressure being a force of from three to five atmospheres.

Subsequently Dr. Mathew produced a portable Atomiser which consists of the forcible expulsion of air & liquid again at the same time, this method can be imitated by taking a syringe recently emptied, withdrawing the piston & then pushing it forwards sharply when the liquid remaining
in the nozzle will be expelled with the air forced out making a fine but evanescent spray. Mathieu exhibited this construction to the Academy of Medicine of Paris in 1859, she called it a Nephosèze or in English a Nebulizer. Fig. 11 is a rough sketch of this apparatus.

Matthieu’s Nebulizer

Fig. 11

*a. Glass globe containing the fluid to be nebulized. 
b. Gas tube. 
c. Flexible tube conveying the condensed air from the Reservoir (d) to the gas tube. 
d. Air reservoir. e. Compressed pump.*
Dr. Savers also invented an apparatus for producing a spray by the agency of bristles attached to the circumference of a wheel. The wheel is quickly turned so the bristles dip into the fluid and afterwards strike a ledge and scatter a fine spray.

Reichenheim proposed an apparatus by which steam and spray were produced at the same time. A receptacle was tightly closed by a cork. A tube was passed through a hole in the cork almost to the bottom of the receptacle. The external end of the tube was turned at an angle, and made to end in a very fine point. The apparatus was supplied with water heated. The liquid generated steam, the steam could not escape, the liquid was therefore forced to escape by the capillary and after the tube in a fine stream, this small stream was impinged against some resisting medium such as a conical piece of
Fig. III.

a. Contra button against which the fine stream from tube b is thrown.

b. Tube leading down to the liquid to be nebulized.

c. Cloud of spray.

d. Fluid which is forced up tube b by the steam generated at c.

e. Portion of the vessel containing steam.

f. Spirit-lamp.

g. Vessel containing fluid to be nebulized.
Dr. Lemin of Berlin invented an apparatus which has an ordinary suction pump that forces the liquid into a reservoir, the air within being compressed then becomes a propulsive power, forces the liquid by the opening of a valve out of a very fine aperture, it is then made to impinge on a concave disc & broken into a spray.

Dr. Waldenburgh of Berlin made an instrument as follows, it has a pump a combination of suction & forcing, this pump draws the liquid from the vessel & then drives it out through a capillary opening against a cylindrical drum with a concave plate of metal.

A tube attached to the drum conveys the condensed excess of spray back to the reservoir.

Dr. Fournie (Gazette des Hopitaux July 1861) made an instrument composed of a compressed pump, a reservoir
with a stopcock: a glass cylinder with a tube ending in a capillary opening & made of platinum, under the capillary extremity of the tube is a lens on which the stream is thrown & converted into a spray. The lens portion of the instrument may be introduced into the patient's mouth & the spray produced there.

Dr. Schirnitzl (Wien Medecin ahandte 1862) made an instrument as follows. It consists of a strong cylinder of glass with an airlight metallic stopcock. The air in the cylinder is compressed by a screw instead of a vertical piston, when the stopcock is opened, after a few quick turns of the screw, have produced the desired pressure the stream rushes out through a capillary tube & impinges against a lens.

Another instrument working by pressure is a modification of
Sales-Guiron's & manufactured by Mathewson of Paris, it is easily managed and produces a very fine spray.

It consists of a glass reservoir $D$ in which the liquid to be employed is poured through the funnel $H$. Encompassing the air in the pump $A$, by motion of the lever $B$, the liquid is forced through a small groove in one of the plates forming the joint $E$ and on turning the screw $K$, the smooth plate is more or less compressed against the groove thus regulating the fineness of the stream. A stream as fine as the finest hair can be thus secured if the instrument be properly constructed. This stream impinges against the upper
portion of the cylindrical metallic drum C where it is diffused in a fine spray. A waste pipe E conveys the excess of fluid back into the Reservoir. It is said that the force of this stream is such that it can (the metallic drum being removed) project the stream into the skin forming a mode of endemic medicination. Dr. Lewin of Berlin invented another instrument. It consists of a strong glass reservoir A. It is covered by a strong metallic cap in which there are three openings, one for the introduction of the liquid the subsequent attachment of the condensing syringe B, one allows exit to the capillary extremity of a slender tube C leading to the bottom of the glass tube. The third is covered by a spring safety valve D to prevent too much pressure by the compressed air. The opening of the capillary tube is stopped till the air has been
sufficiently compressed by the aid of the condensing syringe B. When the obstruction is removed, the fluid rushes out with great force through the silted loose disc fixed in the hollow flaps of drum F perforated at G. Badnut the stream. The drum is so inclined that the excess of fluid flows over the edge into anything conveniently placed to receive it. This instrument was useful since the liquid only comes in contact with flaps or the gilded button.

A dozen or more strokes of the piston are capable of causing the fluid to escape for several minutes, thus disposing away, it was continuous working of the instrument during inhalation.
In 1862 Dr. Beeson made an instrument with the following construction. Its principle is in common use for the distribution of perfumes by the apparatuses found in chemist's shops. Dr. Beeson placed two glass tubes with capillary openings, one capillary opening at the end of each tube at right angles to each other. The wide end of the vertical tube is conducted into a vessel filled with the fluid to be subdivided whilst the wide end of the horizontal tube is connected with an india-rubber tube about two feet long, nearly at the end of this india-rubber tube is an elastic bag which is followed by a bellows arrangement furnished at its outer end with a valve which gives access to air along the tube only when the bellows is squeezed.
The bellows is squeezed and air is forced into the elastic bag, the elastic walls of the bag tend to expel the air, so it can only go one way, that is along the india rubber tube & thus onwards along the horizontal tube, the air being thus forced along causes a vacuum in the vertical tube, fluid flows up & it is made into a fine mist by the blast of air faced bell.
Adapters on this principle are made; the force is supplied by the pump blowing along the horizontal tube.

The diagram fig. 9 shows a different method of producing the spray. Here there is only one tube. This dips into the fluid in the bottle; air is forced along the tubing (rubber) connected with the bellows; an exit is allowed for this air at a into the bottle.

The air presses on the liquid; the liquid is forced up through the tube c at the minute opening e, is broken up into a mist. Here the tube b is passed through a cork which accurately fits the neck of the bottle.
Partly on Regens principle, Winkel of Berlin constructed an Atomizer, acting as follows. The air is compressed in a large glass bulb by means of an air pump. From this bulb a tube projects, ending in a fine opening; the fluid to be atomized is put into a glass vessel which is placed above that opening. The bottom of the glass vessel is tube-like likewise contains a very minute opening, as soon as the liquid is poured in the vessel, it begins to flow out through the fine opening, the blast of air produced by working the air pump conveys the liquid into a very fine spray when the stopcock is opened.

A. B. C. D. Stopcock.
The tubes in these instruments through one of which air is forced, in the other the medicament to be atomized may be made either of glass, metal, or vulcanite. Glass tubes may be cleaned by washing in diluted acid. If the capillary openings become blocked this may be relieved by suction at the larger end, or a fine brush may be passed through the openings. A piece of silver wire may be used, but a needle would be liable to fracture the edges if the tube is made of glass.

The perpendicular tube is sometimes bent so as to run under the horizontal tube for the purpose of being more convenient when practising on the maxes anterior and posterior also on special points in the oral cavity, as in Fig XI, also in Figs VI–VIII.
Dr. Cohen of Philadelphia U.S. turned the Bégson's lutes upside down and placed a reservoir on the top as figured below.

Fig. XII

Reservoir

Fig. XIII

Dr. Siegle of Stuttgart is said to have been the first to have used steam as a motive power.

The following is the usual construction of one of Siegle's bégsons.

The boiler is made of metal and heat is supplied by means of a spirit lamp placed underneath the boiler, the boiler is sometimes supplied with a manometer and also sometimes with a thermometer but neither are essential.
The horizontal tube passes vertically down usually, into the boiler by means of a bend in the tube, through an India rubber stopper. [Fig. XIV]

Sometimes the horizontal tube is passed directly into the boiler without the bend, so as to obviate what sometimes occurs, namely condensation of steam in the knee of the tube forming a drop of hot water there which is liable to be projected out and cause discomfort to the person inhaling. (Fig. from [XV])
A glass funnel may be held by the patient, or fixed in such a position as to collect or concentrate the spray as it passes to the air-passages, and prevent it from settling on the face or clothes. A vessel or receptacle is required to collect the fluid caused by the condensation of the spray on the sides of the funnel.

An appropriate apparatus has been constructed by Dr. Reesell, it is as follows: it is made of a turned wooden disc hollowed funnel-like, and prolonged in the middle into a mouth piece about the size of a shilling. The edge of the inside extremity is inverted in a hole is made in the hollowed rim, a tube is fixed to this hole. The fluid caused by the condensation of the spray is conducted
by this tube into a suitable receptacle. This face protector may be fixed on to the steam spray apparatus as in Fig. XVII or be used on a distinct stand as in Fig. XVII.

A great many portable or pocket atomizers or spray apparatuses have been made.

As regards the sensations experienced during inhalation, if the spray succeeds in reaching the glottis a sensation of warmth is often felt behind the upper part of the sternum, the patient often says that he feels it descending lower and lower into his chest.
should the inhalation be continued. Sometimes there is a feeling of
soreness or irritation, but this
is usually a result of too strong
a solution being used for the
inhalation. Rarely Haemoptysis
has been induced, or an attack
of asthma. There is generally
some cough at the conclusion of
the sitting, & the expectoration is
very much easier than before.

The moisture of the spray regardless
of the medicament used itself
in many cases such as, laryngitis,
tracheitis & bronchitis causes relief.
The use of spray inhalations seems
to be the most efficacious mode
of enabling patients to get rid
of excess expectoration from the
lungs, & some writers have stated
that a disagreeable symptom
viz. vomiting & nausea has
been removed by spray treatment.
The cause of the removal of this
is no doubt because the expectoration
is more easily got rid of by the
use of the Spray, & no violent
cough — the cause of the retching —
is required.

The diminution of the quantity
of expectoration is a great help
in some cases; as a cause of
exhaustion being removed — the
patient is able better to keep
up his strength.

A warm spray is usually more comforting
than the Inhaler (person inhaling) than a
cold one. As regards distance of patient
from the apparatus, this must be
regulated by common sense & the
feeling of the person inhaling.

As regards time, the first inhalation
will most probably require the shortest,
not more than five minutes, but
subsequently, the inhalation may
be lengthened to ten or fifteen
minutes, or longer, & repeated from
one to many times a day.
The patient should be placed facing the apparatus and in a comfortable position; the spray should be directed parallel to the axis of the mouth. It is advised that the patient should sit leaning the chest forwards with the arms on the edge of the table on which the apparatus is placed. If it is required to act on the lungs, deep respiration should be employed; if the laryngeal structures the breathing should be short and quick.

Some of the instruments have a special lamp to heat the medicinal solution before it is inhaled. Some patients need to have the tongue depressed to prevent its arching and obstructing the passage, others require the nostrils to be squeezed to overcome the tendency to breathe through them. A special clip for this
The purpose is cold.
The mouth ought to be widely opened
and the tongue compressed into the
floor of the mouth.
Inhalation should not be practised
after active bodily exercise causing
the patient the short of breath,
or should it be used after mental
excitement, so long as the treatment
is rapid and the pulse accelerated.
The inhalation should be stopped
on the first indication of fatigue
appearing.
The patient at the close of the
operation should remain quiet
and at rest for about a quarter
of an hour. The spray condensed
in the mouth should be spat
out of the mouth rinsed.
Occasionally the patient has to
become accustomed to the use of
the spray, by inhaling such bland
substances as milk (boiled) or
plain water.
Steam Atomizers are the best form to use as the spray is finer than that of the hand worked instruments & the spray is volved with more regularity.

In emergencies such as in cases of Haemoptysis there is no necessity of course to wait till the patient is calm before using the Atomizer. The patient should think of nothing but the operation during the inhalation so that he inhales in a proper manner.

Atomization should not be used for the purpose of general medication. All substances soluble in dilute alcohol or in water are suitable for inhalation in suitable strength. Also solutions in glycerine are also sometimes used but a fine spray with these substances cannot be well secured, but for the pharynx & larynx they may be used sometimes with advantage acting unusually better than penicillins & on alunps.
The solutions should be filtered first, thereby getting rid of any solid particles, which might get sucked up and block the fine opening of the tube. The solution to begin with should be weak, so that it may be strengthened if well borne by the patient. Toxic substances should be used with care, for the respiratory mucous membrane is capable of great absorption. Common sense has a great deal to do with the strength of the dose.

The following is a list of some of the chief substances in use for inhalatory purposes. Cold water has been recommended for use in hoarseness, it is also comforting to inflammatory affections of the throat. Warm water is excellent for assisting the detachment and expulsion of viscid mucous from the bronchial tubes. It is valuable.
in laryngitis + croup, 4-8 grs. 
great relief to pharyngitis +
tracheitis, 1/2 in diphtheria promotes
the expulsion of the membrane.
It is useful in Bronchitis +
Asthma.

* Phosphoric Ammon. $1/2 - 1/4$ to the
ounce of water is excellent in
troublesome coughs & painful
 sore throats as Boroolittos + is
much used to combine with
other medications.

* Extract of Bphium $1/4 - 1/2$ to the
ounce of water is excellent in
obstrinate coughs, mixture of Bphum
 can be used in doses of $3/4 - 11/2$
the ounce of water.

* Liquor Asemenalis in doses of $1/2 - 1$
ounce of water acts well in
cases of Asthma, both bronchitis
& nervous. This substance is great
use in Chronic Bronchitis + Asthma
attended by hypnoea, emaciation,
running heat of skin, burning
amnesia + exhaustion, subsequently to the use of a spray of Chloride of Sodium solution this latter solution is of great value in cleaning out the air passages. Perchloride of Mercury 50 to 1 ounce of water is good in supplicative affections of the throat & adjacent parts.

The water has been of service in putrid & offensive bronchial catarrh in Bronchocelestis & sandpenny of the lung. It is sometimes combined with other remedies such as alum & Tannin, as an astringent. Extract of Cannabis Indica has been used in doses of 8 gtt. to the ounce of water, or 8 gtt. to 8 of brine, in same quantity of water said to be good in spasmodic & irritable coughs.

Extract of Commone 50 to 4 ounce of water is said also to be of service in irritable cough. Thunderash of Commone in doses of 8 gtt. to 15 ounce of water also used.
Hydrocyanic acid 11.11 oz to ounce of water is said to be useful in spasmodie asthma, laryngeal spasm, Lactic acid is good in whooping cough and croup, & diphtheria to disintegrate the false membranes. Lactic acid 11.11 - X to the ounce of water is said to have wrought remarkable relief in a short time in some cases of Adema glottidis, & chronic catarrh both of larynx & bronchi, also useful in Hemocephalia, & aphonia from paralysis of the vocal cords. Hyosyamus, extract of 84-8 oz to ounce of water, or five to twenty drops of the tincture is a good sedative to the respiratory organs. Paroxysms of whooping cough & asthma are thus relieved.

Liquor Calcis of the strength of one part of lime to 30, or 100 parts of water has been used with success in treatment of croup.
+ Hippo\textsuperscript{era}, it is said to be a solvent of the membrane.

Potassium permanganate, liquor, can be used in many strengths as a disinfectant in various affections of the throat chiefly ulceration. The strength of the solution may vary from five drops up to a drachm to the ounce.

Initiate of silver 1/10 to the ounce of water, is useful in chronic inflammations of pharynx & larynx, also in granular pharyngitis. The face must be specially protected from this drug when in use.

Alcohol 80\% to the ounce of water. The stronger solutions have been used in Hæmoptysis, the weaker in chronic catarrh of faucæ, pharynx, larynx & bronchial tubes, it is useful as an astringent restrain\textsuperscript{ing} expect\textsuperscript{oration} from the bronchii.
Sodium Chloride. 

Sodium Chloride gas 30-300 is a valuable remedy in all the stages of Bronchitis, relieving cough, irritation of mucous lining, promoting and ultimately diminishing expectoration. In Phtisis it is said to give remarkable relief.

Potassium Chlorate 30-150 to the ounce of water is useful in Pharyngitis and Diphtheria.

Potassium Iodide, has been used in Chronic Bronchitis with Emphysema, Induration and Chronic thickening of laryngeal structures, also in granular thickening of pharynx and larynx.

Potassium Bromide 30-15 has been used in spasmodic cough. Incline of Iodine has been used with great advantage in Chronic Bronchitis and Phthisis, also in Pharyngitis.

Chloride of Ammonium. The beneficial effects of Ammonium Chloride on pulmonary affections has long
been known, but in using it as an inhalation the difficulty was to prevent excess of acid or alkali, both of which are irritants to the mucous membranes. Burroughs Inhaler (Wickers patent) overcomes this difficulty & it is most convenient for general use. To give an idea of its construction I cannot do better than to add a print of the instrument cut from an advertisement.

By passing the fumes through the bottle A which contains water they are deprived either of excess of alkali or acid. The fumes thus inhaled yield cause no irritation & exert a healthy influence upon thickened mucous membranes of the tracheous secretion.
The chloride of ammonium forms from this inhaler may reach the remotest parts of the respiratory mucous surfaces and are absolutely harmless. In the Lancet of February 1887 B.K. thanks says: "In chronic catarrh of the post nasal region so frequent associated with deafness, due either to chronic otitis media, or to obstruction of the Eustachian tubes, I have found the regular use of the Inhaler for weeks or even months give the most satisfactory results. In throat coughs, pharyngeal or laryngeal irritation, relaxation and weakness of the throat, it acts as a most effective local atractive and tonic to the mucous membrane. A solution of the chloride of ammonium of the strength of \( \text{gNO}_3 \cdot 3 \) to the ounce fraction may be used with the spray producer..."
Liquor Sodae Chlorinator 38 to the ounce of water, is useful in the forced expectoration of chronic bronchitis, and said to be useful in consumption.

Sulphate of Baryta gtt. X is used as an astringent to the bronchial mucous membrane where the secretion is copious.

Sulphate of Copper, gtt. X, is used in Pharyngitis, laryngitis, ulcerative tonsillitis, + chronic catarrh of the upper portion of the respiratory tract.

Tincture of Belladonna gtt v. xvi b the ounce of water is useful in night coughs of an irritative nature.

Tincture of Chamomilla has been used for irritative coughs.

Chlormerebrutten is useful in chronic bronchitis + emphysema + in Bronchectasis, also in Gangrena pulmonum.
Oleum Iodochinae has been used in Phthisis, but it is obvious that the odour must be in most cases unbearable. Solubilis Inflata has been used in Asthma.

A mixture of Perchloride of Iron is said to be an efficient remedy for relaxed and atonic states of the mucous membranes especially in persons whose blood is poor. It is also valuable in the Bronchitis of old people, where there are dilated bronchi with profuse expectoration. In haemoptysis in the strength of 1/2 to 1 ounce of water it certainly in some case has a haemostatic effect.

Da Costa recommends its use in the earlier stages of Phthisis as a weak mitalation in hypostatic Aphony. This drug is contra indicated where
Pyrenia casts
Carbonate of Soda is serviceable
where in bronchitis the secretion
is very viscid tenacious; it
appears to soften loosen this
viscous and promotes a thinner
secretion. The dose is 5-11
in a tumbler of water
Balsam of Peru. This substance
is triturated very fine with
Carbonate of Magnesia, and powdered
Liquorice root— the two latter
be in equal parts, and the
Balsam be of the strength
done part to ten of the Magnes.
Calc. + Liquorice root has been
found useful in Chronic pne-
monia and bronchitis. When prepared
in this manner it does not
clog the tubes of the atomizer.
Hydrastis Canadensis. A preparation
of this plant called Aqua Hydrastis
is made by infusing 3 of Pule.
Rad. Hydrastis in a pint of water
to which add half an ounce of glycerine. This has been used in chronic bronchial catarrh with success especially where the expectoration is thick, yellowish and tenacious or stringy. Invatae of Hyoscyamus the active principle of the above plant has also been used in cases similar to the above in the strength of 5% to the ounce of water. Thymol is prepared from Thymus Vulgaris and also from the oil of the fruit of Phycosis Ajowan. This substance has been used as a spray in the strength of 1:1000 in chronic bronchial Catarrh. Resorcin is a derivative of benzol and occurs in white crystalline plates. It has been used as a spray in the treatment of Whooping cough in the strength of one part to 200 of water. In the British Medical Journal of 1854, Volume I page 6 go is an article showing the
Beneficial results of a spray of this substance in thirty cases of whooping cough.

Potassium Bichromate has been used with success in the treatment of chronic pharyngitis & laryngitis where there is much tenacious mucus in those parts. Chronic irritability, the dose used is half to the ounce of water, it is an antiseptic & has also been used with success in lilledema.

This drug has also been used with success in the treatment of chronic bronchitis with strong secretion difficult of expectoration.

Benzate of Soda in distilled water. Strength 5 per cent is recommended for use as a spray for inhalation in Phthisis pulmonum, seven to fifteen drachms the inhaled daily to be continued for several months. British Medical Journal 1852 Vol. 11 p. 125. Ten percent solution.
has been used with success in diphtheria.
Boracic Acid is extremely useful in diphtheria in the form of a saturated aqueous solution or a solution of 2 drachms of Glycerinum Acidi Boracensis to the ounce of water.

Acidum Sulphuricum is sometimes sprayed into the throat for tonsillitis & diphtheria used as a spray for asthma. It is also used in Chronic Bronchitis. There is an article in the Medical Times & Gazette 1867 Vol. 1 p. 519. The strength generally used is one teaspoonful of the acid to a pint of water.

Antiphlog. In the Lancet Oct. 29th 1875 Olkoff is said to have used with success in cases of Hemoptysis this drug in the strength of ninety grains to 8 oz. of water he ordered 5 or 6 inhalations to be taken every half hour.
Iodide of Arsenic. This drug is useful in many of the diseases in which Lepis Arsenicalis is employed, such as Plutonic, Bronchial catarrh, asthma, and in some forms of laryngitis, & pharyngeal affections. The strength should be used is 1:1 to 8 of a one per cent solution in the ounce of water.

Nitrate of Aluminium is said to have been first used by Dr. Hermann Biegel of London in 1862. Dr. Biegel prepared it by dissolving the metal (aluminium) in Nitric Acid, then agitating the crystals repeatedly in distilled water, condensing the solution by evaporation & recrystallizing. He mentions it as doing great service not only in inflammation but also in nervous affections of the larynx & trachea. The dose used by him was from two to six grains in an ounce of distilled water.
Specacuanta, this is the most valuable preparation we possess in cases of Chronic Bronchitis or Winter cough. In giving a description of the uses and value of this drug I shall quote largely from Ringer's Handbook of Therapeutics. Dr. Ringer says, "the successful use of a secret remedy by a well known practitioner induced me, in conjunction with Dr. William Durrell, to try the effect of inhalations of Specacuanta spray in those obstructive complaints, winter cough or bronchial asthma." The following general description of a typical case will serve in most points to illustrate the condition of them all. The patient had been troubled with winter cough perhaps for many years. During the summer he is pretty well, but during the cold months, from October to May, he suffers sometimes without any interruption, occasionally getting a little better then catching cold...
or perhaps he may lose his cough for a few weeks, but again takes cold on the slightest exposure. So short is the breathing, that he can walk only a few yards, especially in the cold air, and finds it very hard work to get upstairs and is often quite unprepared for active life. The breathing grows worse at night, so that he cannot sleep unless with the head propped up with several pillows. He is troubled too, with a paroxysmal dyspnea usually at night, which may last several hours and constrains him to sit up. Sometimes the breathing is difficult only on exertion or in most cases cough, cast winds, or damps, make it much worse. The expectoration generally difficult to expel, and is mucous. In a few cases there is very little; usually however it is rather abundant, often with little or no phlegm. The cough is very violent, frequent, hacking, spasmal, or the fits may last ten to twenty minutes, and even cause vomiting. They are generally brought on by exertion, heat,
in bad cases, so easily are they provoked that the patient is afraid to move or even to speak. The cough & expectoration are much worse in the morning on waking. Sometimes the cough is slight, the expectoration is generally scanty, the disfigured breathing being the chief symptoms. The patient generally wheezes loudly especially at night. In a bad case the legs swell the patient is emphysematous; there is often no rhonchi, or only sonorous & bilious, or a little bubbling rhonchi at both bases.

In such cases as these I have seen perfectly charming results accrue from the use of a spray of Speciumista wine diluted variously with water. The patient generally feels a little irritation at first coughs, but soon a sense of relief follows; in a few hours afterwards the relief is in most cases great. In one or two days there is no
longer any difficulty in resuming the expectoration, and this is usually diminished in amount. The tophus disappears during the day is left in the thoracic parapneum at night or rather in the early morning in a few days ceases entirely. The patient can lie down at night and is able to discard the pillows to prop his back up with.

In true Bronchial asthma the results are very variable, sometimes great benefit ensues, sometimes aggravation however weak the solution used may be. Some patients cannot tolerate the asemanta spray at all.

Fibroid Phthisis and Phthisiodes do not appear to derive much benefit from the use of the spray. Hoarseness is wonderfully relieved often and this especially if recent. Aphonia also is sometimes cured if the asemanta spray.
Dr. Ruge advises the Hecacanuba
Wine of the Buitist Pharmaeopiea to
be diluted with one or two parts
of water & it is better that the
solution should be warmed prior
to using it. It seems rare
necessary to use the wine of
Hecacanuba stronger than diluted
with one part of water. A very
good mixture for use in Chronic
Bronchitis is equal parts of
Aqua Peii & the Hecacanuba
wine.

Aniline. This drug is mentioned in the Lancet
of March 3rd, 1888. The Lancet says that an
Italian Physician D. Bertarelli has published
eight cases of Phthisis in which he used
Aniline inhalations with success. For the
inhalation he used a Segel's spray, he
also gave the drug internally in the form
of antiphrain - i.e. Acetanilide which gives
off Aniline in the body, as Kremiansky
advises, - but as pure Aniline itself.
A list of the principal diseases of the respiratory tract in which the spray treatment is useful:

Group 1: Influenza

Bacterial affecting mucous & larynx

Whooping cough

Hay Asthma or Hay Fever

Adenitis Glottidis

Laryngitis acuta & chronic

Phthisis laryngae

Aphonia - some forms

Bronchitis acuta & especially chronic

Spasmodic Asthma

Hemoptysis

Pneumonia chronic catacthal

Vomica in limb

Gangrene

Phthisis acuta & chronic as a palliative

Pneumococcal

Ludwichte coughs

Pharyngitis

Ear troubles accompanying the Enanthema
Case I

B. D. Age 64. Case of Chronic Bronchitis

This patient came under observation on July 1st, 1887. She complained of dyspnoea and cough always aggravated in the early morning and during the night. Duration of this attack 10 months.

Previous illnesses. Patient first had an attack of Bronchitis in 1866 and was treated for some months in the out-patient department of St. George's Hospital London with benefit. In the following year another attack occurred for which she attended Brompton Hospital for three months. Patient then remained fairly well for three years till 1869 when another attack of Bronchitis occurred complicated this time with Asthma. This attack lasted twelve months and recurred every winter till five years ago when patient removed from London to Hailsham in Sussex where she remained fairly
well till October last, since last October however patient has not been free from the disturbing symptoms of Chronic Bronchitis. Last March Patient left Hailsham and came to Eastbourne. Patient toops x has the appearance of an asthmatic. Lips & face show slight cyanosis, also the nails. Patient has a little anaemicous swelling of feet towards night. Temperature 98.6°. Appetite variable, cough causes vomiting & retching at times. Palpitation & dyspnoea especially the latter are complained of on exertion. There is epigastric pulsation & evidence of dilatation of right- side of heart. Heart sounds—the first sound is weak, the second sound accentuated in all areas. Pulse 80 per minute comparable.

Respirations thirty per minute when at rest, Cough paroxysmal of loose character with much

From July 1st to July 16th various remedies were tried without much benefit. On July 16th treatment by Dewar's hand spray apparatus commenced. The solution used being Venin Freauzon half diluted with warm water. Patient was made to wash mouth out frequently so that none of the solution accumulated in the mouth was swallowed.
July 17th: Patient reports that she was easier during the portion of the day succeeding the inhalation— that is, after 10 a.m., patient slept last night from 10:30 p.m. till 3 a.m. when the dyspnea + cough awakened her. She had no feeling of nausea. Repeat Spray.

18th: Cough easier but disturbed at 3 a.m. this morning. Patient says it takes her half an hour to walk to my house. Repeat Spray.

19th: Very much better, cough easier, sputum expectorated easily without much difficulty, woke at 3 a.m. + remained awake till 3 a.m. then slept till 7 a.m., but experienced no distress from her breathing.

Stir of Vin. Spic. one quarter diluted.

21st: Much better during day, can do her household duties with comfort. Repeat Spray one quarter diluted.

26th: Very much better, has slept all night for last two nights.
no return of dyspnoea, the cough has nearly left. Patient walked to my house in quarter fan hour other too against a strong West wind. Repeat Spray August 1st. Patient walked three miles yesterday without much distress, the clumps have lost all signs of Bronchitis but the emphysema of course remains + with it slight dyspnoea on active exertion.
Repeat Spray Kni Tree. 1/2 diluted.
August 9th I saw patient fuscertained that there is now no dyspnoea nor wheezing at night. Patient is now as well as she can expect the other age + after so many attacks of Bronchitis her friends are astounded at the change in her condition. I saw patient four months later + she was well.
Case II

Vincent John, 65, by occupation a bootmaker. Married. No history of venereal disease. Patient came under treatment by means of the spray on Nov. 25th, 1887. For years he has had cough & dyspnoea during the winter; he came to Eastbourne from London three weeks ago & got cold soon after arriving here, he complains of dyspnoea great on exertion also cough which is much aggravated by exertion. The cough is paroxysmal & the phlegm is very difficult of expectoration although there is much rattling of the phlegm in the chest. When the cough comes on, the cough & dyspnoea are much worse at night-time. On examining the chest, it is evident that both lungs are emphysematous, there is no dulness, but numerous stale sonorous & vibrallant are heard on both sides of the chest antemortem postmortem.
Patient is short & spare, no history of hemoptysis, or night sweats, the pulse is 100 after exertion, & respiration about 30 rather laboured in character.

Nov. 25th A solution of Verum Secarone one half diluted with five drops of mixture of Belladonna & the druse was used.

26th Patient had a bad night, coughed a great deal. The tongue is coated. Internally, a mixture containing Solution of Nitrate of Strychnia (1-100) given internally, & spray of former mixture used.

Patient was not seen again till December 7th circumstances preventing him from coming, she then reported that the last inhalation did him much good, & he would not have come today but his cough was worse again last night which he thinks was due to the weather turning.
colder, the spray was therefore repeated, viz. a solution of Viti. Decae. half diluted, but five drops of tincture of Hyoscyamus were mixed in the solution instead of tincture of Belladonna. Dec. 8th. slept much better last night, expectoration was free of the dyspnoea at night did not disturb him, patient feels better in himself. The spray was repeated. Patient did not return for treatment but left a message for me, stating that he was as free from the cough as he expected to be after the inhalation was wonderful in its effect upon him.
Case III
W. A., 6 ft. 8 in., Widow, Eastbourne.
Patient was first seen on October 6th, 1887. She was then suffering from cough and wheezing worse at night than had been for one week. Patient is stout, twas confined to bed, she suffers very much from prolapsus uteri. On examining the chest, there are heard anteriorly and posteriorly, dry rales but they are not very numerous; at both bases are a few medium rales. On slight auscultation, no dulness elsewhere but at the bases, the cough is incessant; sweatsome.
There is not much expectoration raised but the cough comes as if there were much pleurisy on the chest.
Temperature normal. Pulse 80.
Patient was treated with internal remedies for six days but the improvement was not very satisfactory. On October 11th, treatment by spray was commenced, the
solution atomized being 1/4 ounce had mixture one quarter diluted, the spray at first caused a little inconvenience, cough being increased and a feeling of choking produced, these symptoms however soon passed off.

October 12th Patient had a very good night last night, the best night she had had for a fortnight, the cough was less troublesome after the inhalation, the expectoration was also expelled with more ease.

A few dry rales still heard in chest, the moist rales still heard at the base of lungs. Repeat spray one third diluted.

13th Feels much better, breathes more freely had a comfortable night, says the inhalations have done her much good. No nausea felt. Repeat inhalation, same strength.

14th Not quite such a good night the cough more troublesome,
A few moist-cocspitum beak at
left-lane only. Repeat spray,
17th (October) On the evening of the
fourteenth patient was troubled
with retching in the evening,
but now has brother cough
+ is in usual health. A
spray of the same solution used
again.
Case IV

Mrs. R., aged 50, came under treatment by means of the spray Nov. 23, 1887. Patient complains of cough & dyspnoea, these symptoms which often trouble her in the winter & when once they have got a hold on her, it is with great difficulty that she is relieved. Patient's cough has troubled her during the winter for seven years. There is no hereditary history of Phthisis. Her home circumstances are comfortable. Her previous illnesses have been these troublesome winter coughs. Patient is of the thin type & nervous temperament. Expression of face is anxious. Cyanosis of face is present. Patient stoops & suffers from nocturnal sweats & aggravation of dyspnoea at night time. The tongue is clean, the appetite not good, bowels act irregularly. Palpitation & dyspnoea very marked on slight exertion, heart acts circular after exertion & rapid. The second sound
of the heart is marked accentuated in all the cardiac areas, first sound feeble, but no bruit. Pulse 96 beats per minute after rest, but 120 after exertion. The radial arteries show signs of degeneration in their walls. The breathing is thirty-two per minute, after exertion there is sharp pain in left mammary region. Expansion of chest feeble. Cough troublesome, much expectoration, mucus-purulent in character on waking in the morning. Patient says she expectorates about half a tea-cupful in the morning as a rule. Patient has had syncope on three occasions, the last time of its occurrence was nine months ago, when about half a tea-cupful of blood rather dark in colour was brought up after violent exercise. Percussion shows that the left lung from clavicle to sixth rib has a very flat note.
Thus dulness is present to about the same extent posteriorly.
Anteriorly the breathing is harsh with medium crepitations on the left side, posteriorly the crepitations are more copious. On the right side of chest the note is fairly resonant, but there are heard numerous vibrillant rales, with a few moist sounds on deep inspiration, the breathing is rather harsh.

Treatment by means of spray commenced on Nov. 23rd. On this date a solution was used composed of Vinum D lactis, half diluted with water, with ten drops of Eucalyptus, 20%. The hand spray was used, the spray aggravated the cough at first.

Nov. 24th. Patient reports herself rather better during the rest of the day, succeeding the inhalation, the expectoration this morning was copious but clear.
On inhalation of the same medication was repeated.

Nov. 25th. Cough easier, but otherwise condition much about the same, to day five drops of a solution of Jodoïde of Arsenic & th ounce water combined with a mixture of Belladonna (tinctures) constituted the inhalation.

26th. Patient feels much better. Repeat 27th. Patient reports continued benefit. Rep. 28th. The cough is reported to be much better, expectoration much less, dyspnea less & the night sweats diminished. To day the steam spray apparatus was used & the Jodoïde of Arsenic solution was added. Five drops of solution of Jodoïde of Arsenic & th ounce water constituted the inhalation.

29th. Expectoration very much less, cough much easier than for months. Appetite improved. There is still debility, but much less. Steam spray of solution of Jodoïde of Arsenic & th ounce water constituted the inhalation.
drop to the ounce of water further
five drops of mixture of hypophosphite
in the solution.

December 2nd. Patient expresses herself
as feeling very much better, though
altogether. The condition of chest
shows, that the dulness on the
left side still remains, with,
the hard breathing but the
accompaniments have disappeared.
The expectoration is practically
+ appears to be now of a mucous
type. Respiration 24, Pulse 88.
Patient can walk faster. The
spray was repeated. A week
later patient reported herself as
being as she called it "well."
At any rate the prospect of
the case may be pronounced
as very satisfactory, & patient
herself is delighted with the
success of the inhalatory treatment.
Case V

1st Nov, 1874. In August, this patient had a severe attack of hemoptysis, which seriously endangered his life, with careful treatment as to rest, &c., &c., &c. internal use of Epsol, &c., also a spray of tincture of perchloride of iron; ten drops to the ounce of water, which seemed to be of great service, patient recovered after numerous relapses from the hemorrhages. Two months later, patient had a violent cough causing great anxiety as to the further occurrence of hemoptysis.

On the night of October the thirteenth, patient coughed nearly incessantly all night. At eleven p.m. on October fourteenth a spray of Spec. amn. ointment three quarters diluted with water was administered with the hope of detaching or neutralizing the supposed offending portion of
expectation, the cough was
instantly relieved + a little
expectation raised, + the patient
slept soundly till 6.30 a.m.
next morning! I may mention
that the right lung was in a
state of consolidation with medium
crepitations heard nearly all over.

The same time on till January 1888 M. H. S. was sorely troubled
with a distressing symptom which
came on shortly after meals, usually
after breakfast, this was retching
+ often vomiting, it appeared (although
it was not very marked) that
a cough preceded the retching, in
fact, was the cause of the sickness,
numerous remedies were tried, till
A spray of Iodid Hypocy. & Iodic Chlorid,
gas iii of the ounce of water was used,
this amount (one ounce) of the solution was
inhaled night & morning the result was
eminently satisfactory, the sickness was
stopped + the cough wonderfully relieved.
Case VI  Case of Aphonia

H. M.  Oct. 32.

Patient a delicate looking woman was first seen April 19, 87. was then suffering from a dry cough and hoarse voice which had troubled her for three weeks. Patient was often troubled with cough had a Phthisical aspect & suffers from debility with night sweats has lost flesh the last few months.

Four months ago patient says she coughed up half a teaspoonful of bright blood. Chest shows harsh breathing with increased vocal resonance right apex, the note on percussion is duller than on left side.

Percussion of lungs tender & there is epyonivalence behind sternum on coughing. Various remedies including Arsenic & Strophina were tried till Oct. 11th 87. with improvement of health, but no return of voice; on Oct. 11th a spray of Iodide of Arsenic was used, the strength being 3 drops of 1/100 solution. This was used on four
occasions, about half an ounce of
the solution being intubated by
means of the hand spray at each
setting. 4. On October 28th the
voice was very much improved
in fact nearly restored to the
normal, the night perspirations
also ceased, the health generally
much improved, the cough, the
tenderness of the lungs were
alleviated.

Case vii.
W. Henry, 25 yrs. Patient had been
a riverside worker in London,
came to Eastbourne three months ago
on account of ill health, feeling
especially weak about the chest.
First seen Aug. 2, 1887. Patient then
complained of general debility, restless
ness at night, with cough + dyspnoea.
Night sweats, thirst + tongue very
red + minute. Patient had vomited
the last few months + had recur-
rent attacks of hoarseness + dysphonia.
In the mornings there is yellow
expectoration difficult of expectoration
+ patient says the expectoration
comes he is rare from the throat.
Examination of chest reveals nothing
remarkable but the larynx is
tender to the touch. These symptoms
gradually coming on for several
months had all become intensified
during the last week. The temper
ature was raised being 101° and
the pulse 124. The fever he says
comes on in afternoon & ceases
with a peconiation in the early
morning. The bowels during the
last week had been irregular
these being a tendency to looseness.
The appetite was lost. The urine
is hight coloured but non-albumenous.
Aug. 6th. There was no improvement
in general condition, the cough had
been troublesome, the voice still
hoarse, the tongue however was
scarce as red as before & the pulse was 110.
per minute. On this day a spray
(by means of the hand spray apparatus)
was administered, the solution
used being five drops of Liqueur
Soda Arsenica to the ounce of
water, about half an ounce was
inhaled. On Aug. 9th, patient
again showed himself & reported
that he feels much better, talks
with less difficulty, eats + sleeps
better. The tongue looks healthier
& the larynx feels less tender
to himself & on palpation little
pain is felt. Night perspiration
& fever diminished. Patient
looks much better & the pulse
is 96 per minute. Repeat spray.
Aug. 12½ Much better in every way.
Repeat spray. Treatment with the
spray every three days was continued
until Aug. 23rd when patient had
lost all his bad symptoms, being
better than he had been for months.
A tonic was prescribed, & on
on several occasions I have ascertained that no relapse has occurred the patient remaining in good health.

Case viii

The following case I mention to show the relief obtained in advanced Phthisis where the cough is often so distressing, by means of sedative inhalations.

Dr. Arthur 61, 55, had suffered for 9 months with constant harsh

muf, cough & has tried cough

mixture & nostrums innumerable

without relief. Examination of

the chest showed consolidation

& breaking down of the spires of

both lungs. A few inhalations

of a few drops of Hg organism structure

to the source of water gave

instant relief administered by

a steam spray apparatus. Patient

was unfortunately unable to continue

under observation from unavoidable
circumstances.
Case IX

W. B. aged 72, residing at Eastbourne.

Patient came under observation on December 23rd, 1877 complaining of dyspnoea and cough since August last.

Patient has suffered from these symptoms for twelve years, the cough being worse in the winter—very severe at times— but better in the summer months. She however states that she never has quite lost her cough, the expectoration is raised with great difficulty. Patient is thin and dyspnoea is great on any active exertion, the cough & shortness of breath invariably awaken her at 3 a.m. No history of Hæmoptysis.

Nothing remarkable about the alimentary system.

There is palpitation on exertion, the pulse is also rapid then.

Syrup, shrub emphysema. No dulness, breathing harsh both sides with a few dry rales, no moist sounds.
when patient coughs there appears to be a large amount of phlegm in the chest, but not much is raised, except in the early morning when a good deal is raised after violent coughing. Patient was given internal remedies with a little relief, but on Jan. 6th 88, all the old symptoms returned, as badly as before, the wheezing & cough being very bad, so that recourse was had on January 15th to treatment by means of spray. A solution of Vinum Acanthoe & Aqua Picis equal parts of each was used, about half an ounce was atomized at this & the subsequent sittings. Patient reports that she slept till 9 a.m. when the cough subsided & the expectoration was expelled however easily, & there was not any urgent dyspnoea.
Patient says she breathes more comfortably — which is evident — that she walked faster.

Repeat spray.

January 9th. Cough easy yesterday morning, in the afternoon a large quantity of expectoration was raised. Patient awoke at 9 a.m. this morning with slight dyspnea. Repeat spray.

10th. Expectoration is expelled without the slightest difficulty, slept well all last night, not awakened in the early morning. Patient walked here with comfort although there was a dense damp mist. This weather generally makes her much worse. There is no wheezing. Repeat spray.

12th. Patient awoke last night at 4 a.m. with a little cough nothin to compare with what she suffered from a fortnight ago & previous to that.
There is no wheezing now. Repeat spray.

January 12th. Slept well, expectoration still diminishing & expelled with greatest ease, patient feels better than she has done for months. Repeat spray.

18th. Very much better, says she can walk past, sleeps well & has no cough, although the weather is very cold. There is stronger. Patient says she has not for twelve years been so free from cough as she is now, her husband says the change in her condition is magical. Repeat spray.

23rd. Still very much better. Says that a distressing sense of weakness which was nearly constant has disappeared, this weakness was felt behind the lower part of the sternum. Repeat spray.

26th. Has caught slight cold in head since when seen last, otherwise not worse. Repeat.
In diphtheria I have great faith in the use of the Atroginer worked by the hand bellows, the solution generally used is two drachms of Glycerine of Rosine Acid to the ounce of water, the spray to be used every three or four hours, I have not had much experience of this treatment in those cases where the larynx and trachea have been invaded by the diphtheritic exudation, but where the palate, fauces, or tonsils are affected, can vouch for its great value. This preparation is also remarkably soothing for the irritable and inflamed parts. Patients expressing a feeling of relief after the administration of the spray.
In a case of Hemoptysis occurring in the course of Phthisial consolidation of the right-lung I lately used a spray of Antipyrin, of the strength of 10 grains to six ounces of water, the result was however not satisfactory, I found more benefit from the solution of mixture of Reckliride of Iron (fifteen minims to the ounce of water) the hemorrhage was of the papier had dont continuous the patient constant hawking up blood or bloody spits.

In the intractable cough which persisted after the hemorrhage had ceased, I found the following spray application invaluable manner: 10 drops of mixture of Hyoscyamus to the ounce of water.

My patient now always keeps at hand this sedative solution of Hyoscyamus, it eases the sticking & harassing cough wonderfully, it gives him good nights rest stops the retching which the cough often provoked.
I may also mention the case of a lady aged about 38 who during this winter (1887–8) suffered from a most troublesome cough contracted during the autumn of 1887. This patient every morning suffered from a very distressing cough, the expectoration was mucous & blood-stained, there was also a little prevalent expectoration at times. The physical signs were not very definite for a good many weeks (about eight weeks) then there was found a patch of dulness about size of the circumference of the brim of a small tea cup, in this patch a few expectorations (medium) were heard at times. Various solutions were used with beneficial results as the cough, but the blood-stained spuva were not got rid of till a solution of the following was used eight or nine times runnning with the steam of a hot

\[R \cdot \text{quin. acidi. \ } 1 \text{gr.}
\[H \cdot \text{luminis } \frac{1}{2} \text{gr.}
\[A \cdot \text{gua } \frac{1}{3} \text{gr.}
\text{This acted like a charm}
\text{the haemorrhagic spuva ceased.}
was checked, in fact the expectation after a week ceased, the cough disappeared, the lump lost the abnormal physical signs. I may mention that the patient had not suffered much constitutionally from her cough, otherwise than one would expect from such a continuous hacking cough.

He, Dr. 375, had suffered from asthma for four weeks with slight cough. Patient was first seen on April 15, 1888. Hydrocortisone spray was ordered eight morning with steam atomizer, on April 17th patient had nearly recovered her voice. Laryngoscopic exam. had shown congestion of the true vocal chords with slight catarrh.

Alex. H. Gresham,

April 23rd, 1888.