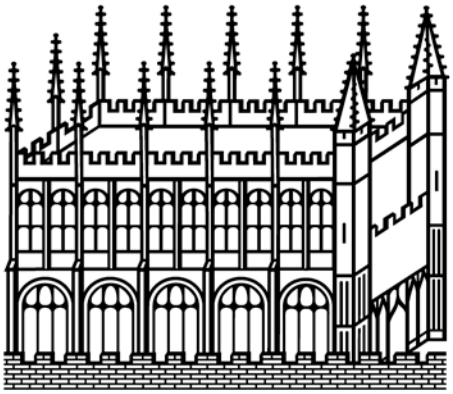

BRONCHITIC AND PEPTIC ASTHMA;

THEIR SUCCESSFUL TREATMENT.

BY

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PREFACE.

THIS Pamphlet is designed to show the great benefit to be derived from the employment of the Compressed Air-Bath and the Water Cure in Asthma. I have taken care to state these benefits with moderation; and I feel sure that any Physician who may put them to the test, under the conditions stated, will find that I have done so.

I make no apology for having made use, in this paper, of the able articles by Dr W. T. Gairdner, on Collapse of the Lungs, and the superior work of Dr Salter on Asthma.

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BEN RHYDDING, OTLEY, YORKSHIRE,
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BRONCHITIC AND PEPTIC ASTHMA.

THE Bronchitic and the Peptic are the most common forms which Asthma takes, and the most difficult to cure. The mere difficulty of breathing is always present, in these cases, to a greater or less extent; and when the asthmatic paroxysm comes on, the sense of impending suffocation is so terrible, that it cannot be witnessed without causing the greatest anxiety to the observer. By a face expressive of the intensest anxiety; by inability to move or speak; by his fixed and distended chest; by the head thrown back between the shoulders; by the muscles of respiration rigid and tightened like cords; by straining for every breath that is drawn, the sufferer, pallid or livid, cold or sweating, manifests unmistakeable evidence of the distress he endures. But not only is asthma thus distressing and comparatively common; it is also peculiarly and proverbially intractable. The asthmatic is generally looked upon as an asthmatic for life. If the intractability of asthma hitherto were otherwise doubtful, the large number of remedies used and given up, as of little or no benefit, would sufficiently prove the fact.

It is the object of this paper to point out, explain, and illustrate a scheme of medical treatment which almost invariably benefits, and very often cures, these forms of disease. This treatment has not been deduced from any theory, nor is it based upon any hypothesis, but is the result of experience only.

Asthma is spasmodic contraction of a greater or less number of the terminal bronchial tubes. It is directly caused by over-excitability of the nerve fibres ramifying over them; by increased irritability of the muscular fibres which surround them; by an

irritated state of their mucous membrane; by indigestion; and by certain poisoned matters contained in the system. In course of time, it occasions general debility; collapse and atrophy of the air vesicles in the posterior and lower parts, and emphysema in the anterior parts, of the lungs; derangement of the action of the heart; venous congestion of the liver and intestines; irregular action of the bowels; hæmorrhoids, and an irregular and feeble state of the circulation of the blood passing through the skin. The dyspnœa of asthma arises from the narrowing of the air passages. The asthmatic's breathing is tight. He feels as if a weight were on his chest, and as if it would be a relief to him to have his breast cut open to allow of its expansion. The muscles of respiration strain their utmost to fill his chest; but scarcely any respiratory movements follow. On applying the ear to the chest, no respiratory murmur is audible, even when not drowned by the wheezing. This intensity of the dyspnœa, and its agonizing and laborious character, show that the seat of the mischief is in the air passages. The sounds of asthma give perhaps the strongest evidence of spasmodic contraction of the bronchial tubes. In health, respiration is noiseless; but in asthmatic cases it is accompanied by a shrill sibilant whistle. We know that hollow tubes of even calibre give no musical sound when the air rushes through them; but if they be not equal throughout, the air is thrown into vibrations, and sound is produced at the narrow parts. The wheezing of asthma is, in the same way, the result of bronchial stricture. It is produced by contraction of the circularly disposed organic muscular fibres which exist in the bronchial wall. The abnormal action of this muscular tissue is due to over-excitability of the nerves, increased irritability of the mucous membrane, and dyspepsia. The nervous system of the lungs is derived from the vagi,—that is, the principal nerves of the stomach,—the cervical portions of the sympathetic, and the anterior and posterior pulmonary plexus. This wide-spread nervous connection enables us to explain some of the more peculiar phenomena of asthma. The nervous system of the lungs consists of ramifying plexuses supported by the bronchial tubes, and carried by them to every part of the lungs. They form a network which includes their finest ramifications, and they are furnished in their course with minute ganglia. The experiments of Volckman, C. J. B. Williams and others, show that the bronchial tubes undergo contraction—in

some cases, even to complete closing up, from the application of various stimuli both to the tubes themselves, and to the trunks of the pneumo-gastric nerves.

The phenomena of asthma arise from reflex action of the nervous system. Whenever the peripheral application of a stimulus results in muscular motion without sensation, we say that the phenomena are reflex, because they are produced without the concurrence of the brain or of the will. This is what takes place in the bronchial nervous system; and thus the bronchiæ know when and where to contract when a plug of mucus is formed, requiring the action of cough to drive it out through a circumscribed strait. Exudations occupying the lesser bronchial tubes are thus expelled, by means of the peristaltic contraction; and offending materials likewise, that may have found ingress through the glottis, are shut off, by bronchial stricture, from reaching the ultimate processes of the lung structure. In asthma excited by the effluvium of hay, and that of certain animals, such as cats, and rabbits—in asthma produced by emanations of ipecacuanha powder inhaled—in asthma caused by breathing ammoniacal and carbureted fumes—in asthma produced by certain airs, and in asthma complicating bronchitis,—in all these the bronchial spasm is of this character; the seat o application of the stimulus and its reflected path being the same as that by which ordinary stimuli arrive, and produce contraction of the bronchial tubes. In the same way, also, is peptic asthma produced, in which the induction or prevention of attacks is entirely controlled by the state of the digestive organs; when an error of diet—eating some particular thing, eating too largely, or too late in the day—is sure to bring on an attack; while a certain dietetic abstention is as certain to be attended with immunity from the disease. Here the reflex character of the phenomena is clear, and the nervous circuits by which the reflexion is completed are evident.

The treatment of asthma advocated in this paper is arranged under the following heads, viz. :—

The Compressed Air-Bath.
The Internal and External use of Water.
Medicinal Remedies.
Diet.
Residence.

THE COMPRESSED AIR-BATH owes its origin to M. Emile Tabarié, of Paris. That gentleman, by a series of carefully conducted experiments carried over a number of years, united to great mechanical skill and ingenuity, not only designed the bath, but showed, with some minuteness and detail, its effect upon the human frame in health and in disease.

The air-bath is a chamber constructed of iron plates riveted together like those of the boiler of a steam-engine, so as to be perfectly air-tight. It is provided with double close-fitting iron doors, and four windows, each a foot and a half in diameter, and composed of a single piece of strong plate-glass. The interior is lined with wood, is furnished with seats and a couch for weak patients. The bath is ten feet in diameter, and twelve feet high. The doors are so arranged that the patients can come out of the bath without affecting the pressure in any way, and the physician can enter and leave the bath at any time also without affecting the increased pressure of the air in the bath. A seven horse-power steam-engine works, at the rate of fifty strokes per minute, a force-pump seventeen inches in diameter and two feet deep, from which there passes an iron pipe four inches in diameter. This pipe opens into the bottom of a large cylinder. In this cylinder are several diaphragms pierced with numerous small holes. With the top of the cylinder a pipe, also four inches in diameter, is connected, and, after running about two hundred and fifty yards underground, opens into the air-chamber beneath the floor, which is pierced with numerous small apertures. By this arrangement the air enters the bath without the patients being aware of any current of air. As much as a pint of water is squeezed out of the air every hour during the continuance of the bath. The patient is thus enabled to breathe a comparatively dry atmosphere, and a large and continuous circulation of air goes on without the patient being conscious of it. A large screw valve is attached to the entrance-pipe, which regulates the access of air to the bath. From the roof of the chamber, an iron pipe, four inches in diameter, is carried down outside the bath into a dry drain, to deaden any noise occasioned by the rapid current of air. This is the exit-pipe, and is furnished with a large screw valve, by which the amount of air passing off is regulated. While the air is being condensed, and after it has been brought to the maximum pressure desired, a sufficient quantity of air constantly enters

and escapes from the bath, so that the patient never breathes the same air twice. Barometric tubes, made duplicate, in case either should fail, and placed within the bath, communicate at their upper extremities with the atmosphere outside, while the mercury at the lower end is subjected to the pressure of the air in the interior. The patients are constantly made aware, by the indexes, of the amount of pressure, which is regulated by the valve in the escape-pipe. An apparatus, by which the temperature of the air entering the bath is regulated, is also attached. The air which is forced into the bath is the ordinary atmospheric air drawn from the moors. Whilst it is being forced along a pipe 250 yards long, with a pressure of seven and a half pounds on the superficial inch, a great portion of the water is necessarily squeezed out of it. Consequently the persons in the bath breathe a pure, compressed, and comparatively dry atmosphere. The duration of each bath is usually two hours. During the first half hour the pressure of the atmosphere is gradually raised at the rate of one pound every four minutes. The maximum pressure is then kept up for an hour, and during the next and last half hour it is allowed gradually to diminish, until the normal state of the air is regained. The slowness in the increase and diminution of the pressure is of fundamental importance in the use of the air-bath as a curative agent. During the whole time of the bath the air is being unceasingly changed, so that the patient never breathes the same air twice over. The patient ought to sit erect in the bath, and to take frequently deep and full inspirations. He ought to keep quiet, and as free as possible from every sort of excitement or worry; and, should he feel drowsy, he ought to allow himself to fall asleep.

In the bath, the respiration becomes slower, fuller, and deeper; and less need is felt for continuous breathing than in atmosphere at the usual pressure. There is at the same time a feeling of comfort in the lungs, and an unusual facility of breathing. These effects arise from the sedative action of the bath—an action which gradually extends over the whole frame; so that a calm, quiet, equable sleep is often produced during the sitting. This sedative influence is often shown in a marked degree in persons suffering from asthma. Each inspiration becomes less laborious, and the imperious and incessant demand for air less claimant, until at length the patient breathes easier, freer, and deeper than he was able to do before going

into the bath. This action especially affects the mucous membrane lining the air passages, and is produced principally by the increased pressure of the atmosphere, much in the same way as the bougie through pressure gradually lessens, and often entirely removes, the irritation of the mucous membrane lining the urethra. The effect here described is of the first importance in asthma. For, the greater number of cases of that disease are caused by increased irritation of the mucous membrane, and increased excitability of the nervous fibres ramifying in the lesser bronchial tubes. This increased pressure of the atmosphere produces a further beneficial result by diminishing that increased thickness or tumidity of the submucous tissue of the air tubes, which is so often present in many of the severer cases of chronic bronchitis and bronchitic asthma. After these improvements, the abnormal secretion of mucous and muco-purulent matter gradually diminishes, until at length the lung membrane becomes for a while almost too dry—a result which often for a time increases the difficulty of breathing,—to be, however, soon followed by permanently improved respiration. There frequently exists in asthma condensation of a greater or less portion of the tissues of one or both lungs, which is not the result of any inflammatory action or deposition of lymph in the air vesicles, but, on the contrary, is altogether produced by bronchial obstruction, from the tubes being plugged up by the increased secretion of tenacious mucus into them, by continuous spasmodic contraction of the bronchiæ, by inefficiency of the respiratory power, and by inability to cough and to expectorate. One or more of these conditions produce collapse of the air vesicles, as the obstruction is never so complete as to prevent the air in the vesicles from passing out from them into the bronchiæ. At the same time, the gradual lessening of these tubes enables the obstruction to act the part of the ball-valve syringe, in preventing the air passing to the vesicles. "The occlusion," says Dr W. T. Gairdner, "is tolerably perfect in the one direction, when the obstruction is driven onwards towards the narrower tubes by the force of inspiration. But the opposite or expiratory force tends constantly to dislodge the obstructing body, by pushing it towards the wider end of the tubes; and hence the exit of the air is always permitted, whilst its entrance is constantly opposed."

The collapsed state of the lungs in asthma is almost invariably of he diffused form; and it affects a more or less considerable portion

of one or both lungs, usually at their posterior and inferior parts, passing gradually into the normal tissue,—the supple, dense, tough feeling being gradually exchanged for the normal spongy, elastic crepitation. I have in my note-book numerous cases which fully warrant me in stating that the air-bath removes this condition of the lung. Only lately I had under my care a very severe case of bronchitic asthma. The patient was 45 years of age, and had suffered from the complaint for more than twelve years. The posterior inferior third of the left lung was quite dull on percussion, with slight resonance of voice. No respiratory murmur could be heard in this portion of the lung. After the compressed air-bath had been taken daily for six weeks, a slight, moist, respiratory murmur began to be heard in several distinct small portions of the condensed lung, principally in the upper part; and each week after this period, the healthy murmur was found gradually to extend more and more, until, at the end of the fourteenth week, it was heard over the entire extent of the formerly condensed portion of the lung.

The manner in which the compressed air-bath produces this most important result, is, I think, satisfactorily explained by the mechanism of respiration. The general principle of its operation is this:—The lungs are suspended in a cavity that is *completely closed*, being bounded above and around by the bony framework of the thorax, the interspaces of which are filled up by muscles and membranes; and being entirely cut off from the abdomen below by the diaphragm. Under ordinary circumstances, the lungs completely fill the cavity,—their internal surface, covered by the pleura, being everywhere in contact with the pleural lining of the thorax. But the capacity of the thoracic cavity is susceptible of being greatly altered by the movements of the ribs, and by the action of the diaphragm and of the abdominal muscles. When it is diminished, the lungs are compressed, and a portion of the air contained in them is expelled through the windpipe. On the other hand, when it is increased, *the elasticity of the air within the lungs causes them immediately to dilate, so as to fill the vacuum that would otherwise exist in the thoracic cavity, and a rush of air takes place down the air tubes towards and into the air cells, to equalize the density of the air they include* (which has been rarified by the dilation of the containing cavities) *with that of the surrounding atmosphere.* Now, the compressed air not only stops, more or less entirely, the increased secretion of mucus and the

spasmodic contraction of the bronchial tubes, but it also adds an increased pressure of seven and a half pounds to the inspired air, so that it rushes with proportionate increase of impetus into the air tubes, and in this way helps gradually to force open the collapsed air vesicles, so as to enable them to resume their proper functions.

I feel sure that the condensed air has, indirectly, a most important and beneficial influence upon emphysema of the lungs. It has now been proved, especially by Dr W. T. Gairdner of Edinburgh, that emphysema of the lung depends essentially upon collapse of a portion of that organ and pulmonary atrophy. Both these states may be present at the same time in the lung, or either of them may be absent. The *rationale* of the production of emphysema in a collapsed lung is as follows:—Emphysema is "an *increase in volume* of those portions of the lung to which the air has access, to supply the place of *diminished volume* in those parts from which it is excluded. It is produced by the expansion of the chest in inspiration, and is dependent simply upon the normal expansive force being exercised under the abnormal conditions to which we have alluded. It cannot be produced in health by any amount of inspiratory violence, because the lung admits of being readily and easily expanded, without straining any of its air cells, to the full volume permitted by the expansion of the thoracic walls. It cannot even be produced in disease, except when the volume of the lung is strictly diminished in relation to the space which it has to fill in inspiration." Collapse of the lung occurs chiefly at the back parts, especially *internally* and towards the root; whereas emphysema is invariably developed towards the surface, and especially towards those surfaces most directly under the influence of the expansion of the most moveable portions of their thoracic walls. The diaphragmatic, the sternal, and the anterior costal surfaces of the lungs are the seats of election of emphysema; while the central and posterior portions are most frequently chosen by collapse and its results. In other words, the air vesicles in which the muscles of forced respiration act directly, and especially those in contact with the most dilatable parts of the thoracic wall, are the most rarely affected by bronchitic collapse. Their bronchiæ, on the contrary, are usually maintained freely pervious, even in atrophied lungs; and they are expanded beyond the normal proportions by the powerful action of forced inspiration. In those vesicles, on the other hand, which are only secondarily brought

under the influence of the dilating force, or which are in contact with the posterior portions of the thoracic wall, where little movement occurs, mucus accumulates, and collapse of the lung occurs as a consequence.

Now, during the compressed air-bath there is no forced expansion of the chest made by the patient. On the contrary, the respiration is slow and equable; and there is at the same time a fulness and freeness of breathing not felt out of the bath. The patient can speak louder and longer. He can count slowly often four times as many numbers, without once respiring, as he can out of the bath. In the words of a physician in the most advanced stage of asthma, and who was under treatment here,—"During a period of ten weeks I have used the air-bath about fifty-six times, and now find my breathing easier, my cough abated, the expectoration diminished, and general health much improved. I attribute considerable importance to the air-bath, from having experienced (especially of late) peculiar sensations, indicating a powerful operation upon the organs affected. From the first, it has appeared to me that I could *breathe deeper*, while sitting in the compressed air; but within the last two weeks, this sensation has been much more distinct. I can now perceive with the eye a fuller expansion of the ribs, and the effort to take a deep inspiration produces much less irritation and tendency to cough than when out of the bath. I have particularly remarked latterly, a greater distinctness and strength of voice whilst in the air-bath; and this circumstance has been remarked to me by patients in the bath, who had heard the sound of my voice at other times." This physician is about fifty years of age, and has been suffering from bronchitic asthma, in its severest form, for the last fifteen years. The consequence is, that while the collapsed vesicles are being enlarged to their normal size, and so increasing greatly in volume, the distended air vesicles, which have not quite lost their elasticity, are stimulated to contract, partly by the increased quantity of oxygen they receive, partly by the increase of function thereby occasioned, but principally by the increased space which the collapsed vesicles fill, while enlarging to their normal state. From these circumstances, those emphysematous portions of the lungs which have not yet become quite disorganized, are gradually restored to their former capacity. The compressed air-bath has thus, directly and indirectly, the power of restoring the collapsed and over-distended air vesicles,

more or less completely, to their original state, enabling them to perform their functions in a more efficient manner than they would otherwise ever have been able to do.

Besides these purely mechanical actions, the compressed air-bath enables the lung to perform its functions with more energy and completeness than can be effected under the usual atmospheric pressure. For, while the volume of air inspired into the lungs in the compressed air-chamber is composed of the same relative proportions of its component gases, still, absolutely, it contains a greater amount of each of them. An increased quantity of oxygen is, therefore, necessarily presented to the blood, and that under circumstances peculiarly favourable to its absorption,—namely, the increased pressure of the atmosphere sustained during a lengthened period. This increase of function within the capability of healthy action is of the first importance in the congested state of the lung, which always accompanies, more or less severely, all asthmatic states of that organ. For, however congested with blood an organ may be, it is relieved when the organ is again enabled to perform its functions with full vigour. The following experiment proves this fact in regard to the lungs. Place a stop-cock in the windpipe of a dog, the animal being under the influence of chloroform, then open the walls of the chest. When the stop-cock is shut, the lungs soon become congested, and the right side of the heart distended with blood. Open the stop-cock, blow atmospheric air gently into the lungs; and the congestion of that organ, and the distension of the right side of the heart, will soon disappear. If an atmosphere at the usual pressure, but containing a larger amount of oxygen than it usually does, be breathed, the pulse increases, the body becomes feverish, and the blood takes on the inflammatory state, so that, if the lungs are in a state of disease, they are apt to be prejudicially affected. But these phenomena do not take place in the compressed air-bath. On the contrary, the respiratory movements become gradually slower, and the pulse less rapid, whilst at the same time the patient is enabled to take a deeper inspiration. He feels that his chest is better filled with air, and that he can speak longer and with a deeper tone of voice than he could before entering the bath. His skin is cool; he has sensation of languor over his entire frame, and frequently falls asleep; but when he leaves the bath, he is more buoyant in spirits than when he entered, and

his appetite is increased. This description of the effect of the compressed air will explain, to a certain extent, how benefit in asthma results from its use. In this disease, as we have before stated, the air tubes are narrowed to a greater or less extent, the nervous fibres ramifying over them are excited, the muscular fibres which surround them irritated, the mucous membrane which lines them frequently relaxed or thickened, the capillaries around the air vesicles deeply congested with venous blood, and the vessels themselves more or less filled with effused serum. The compressed air gradually overcomes the spasm, soothes the excitability, lessens the irritation, braces up the lining mucous membrane, and removes the congested state, thus allowing the effused serum to be absorbed. It helps to remove the collapsed state of the air vesicles, and it indirectly assists to diminish the capacity of these vesicles when they have become distended; so that, after a while, the air is enabled to enter and escape more freely, and the oxygen gas is more easily transmitted to the blood, and the carbonic acid removed from it, than could otherwise have taken place. When the action of the heart is irregular, the compressed air-bath is usually of great service in modifying, and sometimes in entirely removing, the irregularity, and the palpitation of the heart, which so frequently accompanies asthma. Indeed, the compressed air-bath seems to act specially upon the heart. In cases of severe irritability of the heart, when its action is rapid, and the feeling of palpitation extremely uncomfortable, I have found the daily use of the compressed air-bath, continued over a period of about six weeks, quite remove this state. I may moreover add, as an interesting fact connected with the air-bath, that it is of importance in those cases of chronic headache which seem to be dependent upon exhaustion of the brain from overwork and too long-continued study. I have had several young gentlemen under my care from our Universities, who have taken high honours as the results of laborious study, but who were afterwards unable in consequence even to read a light book without suffering from headache, and others with whom the headache was continuous. The water treatment, and a residence in this fine bracing air, seemed to have scarcely any effect upon the complaint; and it was only after the use of the compressed air-bath for a certain time that the symptoms were alleviated and ultimately removed. Some of these gentlemen had travelled on the Continent, others in

the East, and two of them in America, without any advantage having been derived so far as related to their chronic headaches.

WATER TREATMENT.—Although the compressed air-bath can do so much towards the cure of asthma, still it is unable to give increased vigour to the system, or to remove the prejudicial effect which the long continuance of the disease has produced upon the abdominal viscera. For these purposes, a suitable employment of the water cure is necessary, of which the following is a sketch:—

For the first fortnight or so, the chest is rubbed with the hand and cold water for twelve minutes twice or thrice a day. Every morning the patient has a dripping sheet. He drinks two tumblers-full of cold water during the day, and now and then, at bedtime, he has his chest fomented for from fifteen to thirty minutes. During the next fortnight the chest is spouted once or twice a day with cold water, for a shorter or longer period. The rubbings of the chest are still continued, and the dripping sheet is also applied. A wet compress, exactly fitting the chest, and covered by Macintosh cloth, is worn constantly over the front and back of the chest. At the end of the first month, the patient is usually much stronger than he was at the commencement, and, as a consequence, the treatment becomes more varied. The towel, or the whole envelope, or the Roman bath, is prescribed to remove the old cuticle, stimulate the glands, and increase the circulation of the blood through the skin. For dyspepsia, venous congestion of the abdominal viscera, sluggish action of the liver and hæmorrhoids as the effects of asthma, the sitz-bath, the stomach compress, the percussion of the liver, the rain-bath, the ascending douche, and the shallow-bath, are employed according to the symptoms present. I shall state shortly the effects of the most of these processes upon the disease, and upon the diseased condition of the frame.

The friction of the chest with the hand in cold water is of very great service in asthma. It brings over the chest a fine glow of warmth, which, after a few days, remains continuous. It also produces a soothing influence, and, by stimulating slightly the terminal nerves on the skin, it makes the breathing easier, and lessens the spasm of the tubes. This rubbing is so comforting, that the patient not unfrequently falls asleep while it is being carried on. Nothing

in the practice of hydropathy shows better the efficiency of very slight treatment, suitably applied, than this does.

The dripping sheet in weak persons is a most invigorating bath, and it is remarkable how soon it brings back former vigour to the frame. The thorough rubbing of the entire body for some minutes in the wet sheet, and the perfect drying afterwards, give such a feeling of lightness, and such a freshness to the frame, just after rising in the morning, that a fillip, which continues for several hours, is communicated to it. When the patient goes out early in the morning after this bath, instead of feeling chilly and languid, he is brisk and cheerful. He can take his morning walk with comfort, and he sits down to breakfast with a thorough relish. The spouting of the chest, both back and front, is perhaps the best curative bath in asthma. It helps to relieve the congestion of the lungs. By its sedative action, it temporarily diminishes the spasm of the air tubes, and, by the stimulation of the spinal nerves, it deepens and increases the frequency of the respiratory movements. It produces a greatly increased circulation of blood over the entire thorax, generating a heat in that part of the body which continues for nearly the whole day, and so guards the chest from becoming chilled. This is the bath which I use most frequently, and more continuously, in the water treatment of asthma than any other.

The wet compress acts, first, in lessening any irritation and soothing any irritability in the chest; and, next, as a tonic. The cloth is always wrung out of cold water, and applied in this state; but, from there being very little water in it, the slight chill at first produced is almost immediately removed, and a glow is produced from the tonic influence of the cold. This warmth is kept up the whole time the compress is on the chest by the continual slow evaporation which takes place. The application does not weaken the chest like a poultice, nor does it act in the same way. In the latter case, heat is applied to the body, and, as it departs, that part to which it is applied becomes chilled; whilst in the former the heat which warms the compress is generated in the body, and slowly withdrawn from it by evaporation. The continual demand of the compress for heat produces an action upon the skin, by means of which heat is generated and given off to the compress; so that the compress is at the same time a soothing and a tonic remedy. In chronic bronchitis, and consequently in asthma dependent upon or combined with this

state of the mucous membrane, the compress is a most powerful curative remedy. I have frequently seen it removing the most stubborn bronchitic state, when every other remedy has failed.

The use of the envelope in asthma requires great discernment. For, in many conditions of that disease, it will be found to act prejudicially. It ought to be only rarely used in pure nervous asthma, particularly when the patient is very weak, or when he is of a nervous temperament. When, however, this bath is suitable, it always produces a most beneficial effect. The patient lies in it usually for three-quarters of an hour, well wrapped up, and carefully covered by dry blankets and a light feather-bed. After a few minutes, he feels gradually getting warm; and in half an hour he is so comfortable and soothed, that he is inclined to fall asleep, which he often does. When the blankets are removed, the sheet gives off a slight warm vapour, the body feels warm to the hand, and a gentle moisture bedews the entire skin. The patient is then well rubbed in a dripping sheet or shallow bath, and well dried afterwards. Dressing as quickly as possible, he takes as much exercise as he can within doors, or, if able, he goes out for walking exercise. This bath stimulates the whole of the glands of the skin. It separates the old cuticle, and produces an increased circulation of blood over the entire frame; and in this way helps to remove the congestion of the viscera. The soothing effect of the envelope, and its tendency to remove fever, and any depression of spirits that may be concomitant, are some of its most valuable characteristics. No other remedy with which I am acquainted can equally produce them. In cases of fever, aconite is acknowledged to be the most powerful remedy possessed by the profession for lessening the pulse, and removing febrile symptoms; but its power in these respects is not at all to be compared with that of the wet sheet envelope. When the Faculty becomes acquainted with the safe and powerful effects of this bath in fever, it will be as frequently employed as the lancet used to be. If Priesnitz had done nothing more than to make society acquainted with the use of the envelope, his name would deservedly pass down to posterity as that of a great benefactor to the human race. Besides its sedative effect, it frequently causes the expectoration to become reer and less tenacious. A patient, after coming out of tne envelope, can usually walk with much greater ease than he could have done before.

During the last fourteen years, several cases of bronchitic asthma have come under my care, which appeared to have arisen from badly developed measles or small-pox. Asthma, in such cases, depends upon a poisonous matter contained in the system. This materies morbi affects the mucous membrane, causing an almost continuous chronic bronchitis, and irritates the nerves of the lungs and of the stomach, so that the least derangement of the latter organ at once produces an asthmatic attack. The spasm of the bronchial tubes is then to be regarded as one of the accompaniments of the disease, rather than the disease itself. The envelope, in such cases, is of very great service. Indeed, nothing else seems to do the least good, unless that application form a part of the treatment. I have several cases of this form of asthma in my notebook. After the daily use of the envelope for two months or more, a crisis has been produced, which has removed an immense amount of effete matter from the system. This action continues usually for about four weeks, when the bronchitic asthmatic state is removed, and the digestive organs are restored to a healthy condition. From these results of the treatment, I feel sure that the cause of the disease is a poison in the system; for no benefit from the treatment appeared until a crisis was produced, after which the disease was cured, or greatly mitigated.

The Roman Bath is of service in peptic asthma. It soothes the irritable state of the pneumo-gastric nerves, and lessens the congested condition of the mucous membrane of the stomach; whilst the free perspiration which it produces, assists in relieving the overloaded state of the blood-vessels in the other abdominal viscera. Moreover, breathing the hot air for an hour or so lessens the irritation of the lining mucous membrane of the lungs, and the expectoration becomes less tenacious and more free.

The Sitz Bath is one of the most useful baths we possess in peptic asthma. It ought always to be given shallow, and as cold as the patient can bear it. This bath has a marvellous effect in regulating the bowels, in stimulating the congested liver to action, and removing the hæmorrhoidal condition of the veins of the rectum. This bath, assisted by the stomach compress, rarely fails to remove the flatulency and torpid state of the bowels, so common in peptic asthma. This short sketch of the effects of the curative use of water in asthma, is perhaps suffi-

cient to show how it is employed; and therefore I shall not enter further into details.

Medicinal Remedies.—I am decidedly opposed to the use of all medicinal sedatives in asthma, except perhaps that of stramonium, because I feel certain that they fix the disease more firmly in the system, injure the constitution, and after a time increase both the number and the severity of the attacks. This I believe to be especially the case with regard to chloroform and ether. Stramonium is usually a mild and safe remedy, and frequently is of great service at the beginning of an asthmatic attack, although in some rare instances it has been found to act deleteriously on the system. As a remedy for asthma, it was introduced from India in 1802 by General Gent, and soon obtained a high reputation in alleviating the attacks. But perhaps no drug has been given with more contradictory results. In some cases it is *the* relieving remedy, whilst in others it seems to be of no benefit whatever. "Sometimes," writes Dr Watson, "it calms the paroxysm like a charm. The late Dr Babington told me of a patient of his, who had been grievously harassed by asthma for a series of years, but who declared to him, after he had made a fair trial of stramonium, that he no longer 'cared a fig' for his asthma, which he could always stop in a moment. So a Mr Sills, in a collection of communications relative to the *Datura stramonium*, published in London in 1811, states that he had been a great sufferer from asthma; that the fits continued, with short interruptions, from thirty-six hours to three days and nights successively, during which time he had often, in the seeming agonies of death, given himself over, and even wished for that termination to his miseries. But, having at length discovered the virtues of stramonium, he uses this strong language, 'In truth, the asthma is destroyed. I never experience any ill effects whatever from the use of the remedy; and I would rather be without life than without stramonium.'"

"In most of the cases," says Dr Salter, "that I have personally witnessed, it has given only temporary relief—mitigated, rather than cured the spasm; but in a case recently communicated to me, its effects appear to be nearly as striking as in the cases I have just quoted. The patient was what was commonly termed a 'martyr to gout,' and suffered most severely from asthma. He could not

walk, in consequence of the gouty state of his legs and feet; and one of his amusements was to pick the chalk out of his fingers with a knife! 'I remember,' writes my informant, 'one day, when I was at his house, he came home in his little hand-carriage, in which it was his wont to be wheeled about; and, on being helped into the parlour, he was in such a state from a violent attack of his asthma that he could not speak, but made signs to his daughter, by pointing to a cupboard, that she should reach him his pipe of stramonium. She lighted it; and, after he had taken a few whiffs, the breathing became relieved, and he was able to speak; and, after a few more, the spasm and oppression so completely vanished, that he could converse as well as usual.'

"On the other hand, one is always being disappointed with it. In a large per-centage of cases it does no good at all; and in some it has been said to prove injurious, and in a few instances fatal. Dr Bree tried it in eighty-two cases; in fifty-eight of these it had no permanent effect, and in the remaining twenty-four it acted injuriously. General Gent, who was instrumental in introducing the practice, is said to have fallen a victim to it. Aggravation of the dyspnœa, paralytic tremblings, epilepsy, headache, and apoplexy, are some of the evils said to have been induced in some of the cases above referred to.

"To what are these contradictory results to be attributed? Partly, doubtless, to the caprice of the disease, which behaves in the most irregular way to all remedies; but partly, I think, to the mode of preparation and drying of the drug. An asthmatic patient of mine informed me, that while he received great benefit from stramonium grown and dried by a relative of his, that which he gets at the shops does him no good whatever. He sent me a specimen of this home-prepared stramonium; and it was certainly a different thing, both in appearance and smell, from what one commonly sees: it had not lost its fresh greenness, nor the genuine solanaceous smell. I think, therefore, asthmatics would do wisely to grow and prepare their own stramonium. Part, too, may depend upon the time at which it is administered. Stramonium, like other remedies, will cut short an ncipient spasm; while over one that has been long established, it has but little power. The great thing is to give it in time; and for hat purpose, since the patient in general is awoke from his sleep by the paroxysm, he should put his pipe, already filled, with the means

of lighting it, by his bedside overnight, so that, on awaking with the dyspnœa, he might immediately use it.

"My friend, Dr Buller of Southampton, tells me that he has seen benefit from the inhaling (not the mere smoking) of stramonium smoke. 'A year ago,' he writes, 'I met with an old asthmatic who had cured himself, and relieved many others, by using *cold* stramonium smoke. He smoked the stramonium as you do tobacco, then puffed the smoke into a tumbler, and then inhaled the cold smoke into his lungs. I am now attending an asthmatic lady who could not inhale the hot smoke, but who inhales the cold smoke in this way with great relief.'"

I rarely recommend anything being done when the attack of asthma has regularly set in. For remedies then seldom do any good, and they are apt to be injurious to the system, and to fix the disease itself more firmly in the constitution. But if smoking stramonium in the incipient stage does not remove the attack, I then, in uncombined asthma, advise the patient to inhale the fumes of burning nitre paper for several minutes. This remedy is often remarkably efficacious in warding off an attack. It is to be remembered that nitre paper is rarely of much use in advanced stages of bronchitic asthma. The nitre paper is best made in the following manner:—Dissolve as much nitre as you possibly can in hot water, and, while the solution is warm, draw three times through it, slowly, moderately thick blue or red blotting paper. Dry it before the fire, and cut it into pieces three inches broad and six inches long. The nitre paper should be kept in a dry place, when it will not be the worse for any length of keeping. I generally recommend two pieces of the size mentioned to be burned at the commencement of an attack.

When patients are very weak, I find the use of the hypophosphite of manganese and iron to be the tonic remedy best suited, in conjunction with the general treatment specified herein. This remedy has an effect in diminishing the heart's action; and when associated with the compressed air-bath, I have found it entirely remove this disagreeable symptom.

Diet.—Asthmatics are generally more or less dyspeptic. Of all forms of prophylactic treatment, therefore, a carefully regulated diet is perhaps the most successful. The tendency of food to pro-