symptoms of dyspepsia; and often I have found audible signs of disease where the patient has not complained of any cough whatever. In other cases, when I have not been able to satisfy my ears, but felt sure, from the symptoms complained of, that mischief was brewing, the signs have at last often become evident. Whenever we meet with some of the early symptoms of phthisis in patients who have hereditary tendency to the disease, I think by far the safest plan is to treat the patient as if the lung-disease could be distinctly heard.

Now in this, the hereditary disease, I do not think that we have any specific remedy on which we can depend; but, at the same time, we have a mode of treating these cases which often, when I have hardly hoped for success, has proved very successful and satisfactory.

In treating this disease, I am afraid we are all apt to follow fashion, to prescribe remedies and modes of treatment at the time in vogue, and to forget the treatment which sound common sense, combined with a reasonable amount of medical knowledge, would dictate to us.

The patient should live in a part where the air is pure, neither too dry nor too moist, and where the climate permits out-door exercise to be taken. Hence, removal to some of the places celebrated for this climate, is often of marked benefit, simply because the patient can then take plenty of exercise.

If, in this class of case, the patient can take cod-liver oil, he certainly should; and I have certainly seen the remedy act wonderfully, as if it had a specific effect. It has relieved the cough, fattened and strengthened the patient. On the other hand, many patients cannot take it in any way, or at any time, without suffering in some way or other. They feel sickly, suffer from dyspepsia after it, are relaxed, or have their appetites spoilt by it.

I have tried the inhalation treatment extensively. Some patients say that they have derived benefit from the treatment, and cough has been relieved, the quantity of expectoration has diminished, and the general symptoms have improved. Others seem to derive no benefit whatever; the inhalation in these cases increases the cough, impairs the appetite, and makes the patient ill.

In this, as in the other two varieties, I attach the greatest importance to the amount of out-door exercise taken, or in-door if the former be impossible; to proper ventilation, to the climate, the sponging of the body, and the taking of suitable food; and, as internal remedies, have found quinine, iron, and some of the vegetable tonics the most useful.

The object I have had in bringing this matter before your notice has been to show that, in the first variety, we have a disease produced by local irritation only. The fever is secondary, and I feel sure that if we can only remove the cause we do much towards the cure. In the majority of cases in the first and second stages, attention to general health, together with the administration of a few well-chosen remedies, will often effect a cure, and sometimes even in the third stage.

In the second variety we have something more formidable to deal with; something present in the lung, and a cachectic state of body. Unless this be grappled with at once, the lung will be sure to break down. The best way of treating that body is to place it in an atmosphere of purity, to surround it with sights which afford food to the mind and divert from self, to compel it to take exercise, and thereby create necessity for food, promote healthy changes in the lungs as elsewhere, and to supply to the stomach that food which is most beneficial; in this way, cases which have been at a standstill for a long time, will often change for the better. In the third variety we have hereditary tendency to deal with, and must endeavour to treat it early; as in the later stages, owing to this tendency, it is a most serious disease to have to contend with; and in this class cod-liver oil, if it can be taken, acts beneficially; probably the inhalation treatment is also useful, but, above all, pure air, exercise, and good food, are our best friends.

ON ANTISEPTIC INHALATIONS.

Read in the Section of Medicine.

By SOLOMON C. SMITH, M.D.,

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At the present day, when antiseptic inhalations in one form or another are frequently prescribed, and commonly used even without prescription, I think we ought to endeavour to arrive at some definite conclusion as to their mode of action, and as to the way in which they produce those beneficial effects which are commonly attributed to them.

The shortness of time makes it necessary to place some limit to the subject; I do not propose, therefore, to discuss the question whether or not these inhalations are beneficial. I think we shall, most of us, agree that, be their action what it may, we find that, while treated by an an-

tiseptic atmosphere, patients often experience a considerable relief of cough, and often gain flesh and strength; so that we have come to understand that in certain cases these inhalations do good, and the question is, how do they do it?

The subject must also be limited by provisionally accepting the theory that many cases of bronchitis, especially those with bronchiectasis, become dangerous chiefly in consequence of septic processes resulting from the growth of bacteria in their dead expectorations, and that phthisis arises from the development within the living tissues of the lung of crowds of bacilli, which, by setting up tuberculosis, a process consisting partly of irritative overgrowth, and partly decay, lead to the destruction of the lung.

The term antiseptic, in fact, presupposes the existence of some such septic processes as we now know to be caused by bacterial growth. It has long been thought possible, by inhalations of creasote, to limit decomposition in the expectoration; but, now that the investigations of many observers have shown the constant presence of certain bacteria in phthisical disease, the hope is that not only may antiseptic inhalations control septic processes in dead secretions, but that they may be destructive to those micro-organisms which are at the root of tubercular disease in living structures.

I inquire then, how do they act? What effect can an atmosphere, charged to the extent recommended, have upon these living micro-organisms? Can a respirator keep them out? if not, can any vapour which is fit for respiration destroy them? if not, can it in any other way influence their growth, or check their development, so as to prevent their ill effects?

The first of these three questions we must answer at once in the negative. Any one who takes the trouble to master the details necessary for the successful conduct of experiments on sterile solutions, will see at once the impossibility of keeping bacterial germs out of the body by any form of respirator which it is practically possible to wear; and surely we have no right to believe that the bacilli of tuberculosis are any easier to intercept than the bacteria of decomposition. If we allow that they exist, and that they cause disease, we must admit the almost universal distribution of these infective particles. Every day we must have in our midst within these isles, constantly warring against us, a great army of 150,000 sufferers from this one disease, consumption, scattering amongst us right and left its germs, which, although harmless to the strong, are a perpetual menace, hovering about us ready to invade and breed in our enfeebled tissues, whenever, from disease or trouble, or unhealthy surroundings, our vitality is impaired; the enormous number of centres of infection explaining, as the occurrence of apparently isolated cases of phthisis proves, the wide distribution of the infective particles, and making us despair of success in keeping them out of the body. Can we then kill them if they gain access?

To kill bacteria is one thing, to kill germs is quite another. It has been proved that they can stand a short boiling, that they can be floated in air-bubbles through strong vitriol, that they can be washed with carbolic solution of any strength short of 5 per cent., without being killed, or losing their power of self-multiplication. Is it likely, then, that any vapour which could possibly be inhaled would be capable of destroying organisms which are so retentive of their vitality? I think it is quite obvious that all evidence shows that it is impossible, either to keep germs out of the body, or by antiseptics to kill them. What else, then, can inhalations do?

Several years ago, Professor Tyndall made a discovery which has an important bearing on this subject. While he was performing a series of experiments on the living matter in the atmosphere, it became necessary very frequently to prepare sterile solutions, and he was much troubled by the prolonged boiling which was necessary to destroy with any certainty their contained vitality.

But he found that if, instead of giving his solutions one long boil, he heated them several times for quite a short period, leaving them at the ordinary temperature in the intervals, he could quite readily devitalise them. This method he described as sterilisation by discontinuous heating. He discovered, in fact, that, however hard and resisting the germ may be, there is, in the life-history of every bacterium, a period when it is very soft, tender, and easily destroyed; and that, although he could not touch the germs themselves, he could let them hatch, and, by repeated slight heatings, kill their offspring as they came out, while they were too young to produce a fresh generation; and thus he was able, without ever reaching the point of ebullition, completely to devitalise the fluids which he had found most resisting, even to very prolonged boiling. The recognition of this difference between germs and bacteria, as regards the action of destructive agents, explains many things otherwise difficult of comprehension, and enables one to understand how organic substances can often be protected from

decomposition by the addition of very minute quantities of antiseptics, in proportions quite too small to be in any way considered germicidal.

The *modus operandi* is probably in all cases the same: the germ is allowed to hatch, the young is killed by an antiseptic far too weak to touch its parent, and thus the race dies out. Now, it seems to me that this is the explanation of the action of antiseptic inhalations. The materials which have been found most useful are not mere gases which intermingle with the inspired air and then pass out again with it, but are vapours, gaseous forms of soluble bodies which are deposited wherever their penetrating vapour comes into contact with water.

On every moist bronchial tube, on the walls of every cavity, and even in every congested spot in the lung, the inhaled carbolio vapour condenses and carbolises the tissues; and we are, I think, forced to believe that the benefits derived from the use of antiseptic inhalations are due to this infiltration of the lungs with antiseptic material rather than to any action upon the floating germs.

It must, however, be granted at once that this impregnation of the tissues never goes to any great extent, and the question arises whether so mild a dose can have any effect in preventing bacterial growth. There is plenty of evidence to show that antiseptic inhalations diminish the irritating qualities of the expectoration, and lessen the number of bacteria in it; but there is no proof at all that it can be rendered entirely free from bacteria by any amount of antiseptic vapour; in fact, all evidence goes the other way.

Now, it has often been assumed that, if we cannot stop the growth of micro-organisms in fluids lying in the tubes and cavities, we certainly must not expect to check their development when embedded in the substance of the lung.

But the cases are different; the one is a question of dead matter, the other of living tissue. Decomposition of expectoration obeys the same laws as experiments in test-tubes; but the growth of bacilli in the living substance of the lung is resisted by the vitality of the tissues themselves. Life is the great antiseptic.

There are few points in which the difference between things living and things dead is more markedly shown than in the power live bodies possess of resisting, by virtue of their own vitality, the growth within themselves of those lower organic forms which, in dead tissues, readily take root and grow, and, by their development, rapidly reduce the lifeless elements to their lowest chemical affinities. For scores of years man's body resists decay, and then, when life departs, he rapidly swarms with myriads of bacteria; not that there is any chemical change making his body more suitable food for them, but because they are able at last to take possession, now that the resisting power of his vitality has departed.

As it is with the germs of decomposition, so it is with those of tuberculosis. When they attack the lung, they do not usually at first affect those parts which are most actively performing their functions; the very parts into which they are most freely carried by the air are least susceptible to their attacks; their active vitality is their protection; but, in the apices and parts injured by previous inflammations, they settle and breed disease. And, even when phthisis is well established, and when the air in the chest must be crowded with its germs, large portions of the lung remain for long untouched; showing, on the one hand, how great is the resistance to the disease inherent in the tissues themselves, and, on the other, giving a rough measure of the amount of help required from treatment. For, if the difference between a soil fit and one unfit for bacterial growth is to be measured, for example, by the difference between the functional activity and resulting vital resistance of an upper and a lower lobe of the lung, surely it is not unreasonable to hope that, by impregnating the pulmonary tissues with antiseptic material, which, we know, renders them less fitted for the cultivation of bacilli, we may be able to make up the lacking resistance, and so prevent the access of disease.

When we send a patient to Davos, to an atmosphere so rare that he has constantly to use the whole of his lung to get sufficient breath, instead of breathing with a portion only, as we mostly do, we really give to the whole lung the same functional activity, the same resisting power, which formerly belonged only to certain parts of it, and we know that the disease is often checked.

If, then, the tissues are so nearly able to hold their own, it ought to be possible, by adding the resistance of any antiseptic, to stop the progress of a disease which, according to the premises of our argument, is due to bacterial growth. This may all be mere theorising, but it leads to some very practical points.

First, the material used ought to be capable of absorption by moist surfaces; it should be a vapour, not a gas; and a dry vapour, not an atomised solution.

Second, as no attempt to filter or sterilise the air is required, all

complex forms of respirator may be discarded. The freest possible access of air should be allowed, the vapour being breathed with it as constantly as possible; so that the simplest and most open respirator is often the best, the mere diffusion of the vapour in the room sometimes being sufficient.

Thirdly, we must combine with the treatment by inhalation, all medicinal, dietetic, and hygienic measures which tend to improve the general condition of the patient, and thus increase his vital resistance.

It is worth bearing in mind that the view of the matter, which I have so imperfectly brought before your notice, shows the harmony and unity of purpose which exists among the various means which we make use of in the treatment of consumption.

If we accept the germ-theory of the origin of tuberculosis, all treatment, both local and general alike, must aim at preventing the growth of certain bacteria in the body; the struggle is between one great life and myriads of small ones; and while all general treatment tries, by providing healthy work, good food, and pure air, and by attention to all secretions, to improve man's condition, and make him so suitable to his surroundings, that he, being the fittest, shall survive; local treatment, on the other hand, endeavours to impregnate the lungs with substances so inimical to the development of microscopic forms of life, that the parasite, planted in a soil unsuited for it, beaten in the struggle, shall cease to grow.

ALEXANDER AND ADAMS'S OPERATION ON THE ROUND LIGAMENTS.

Read in the Section of Obstetric Medicine.

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In the *Medical Times and Gazette* for April 1st, 1882, I read with much interest an account, by Dr. Alexander, of Liverpool, of a method of treatment employed by him for the relief of prolapsed uterus; and I determined to put into practice, at the first opportunity, the operation, which seemed at first sight to have much to recommend its adoption. Amongst the lower classes, bad examples of procidentia uteri are met with frequently, and I have often experienced considerable difficulty in finding any instrument to give any kind of support, or that could be worn with comfort.

It was not until July 4th of this year that Dr. Adams's paper came to hand; and it is evident that full justice must be done to his independent planning of the operation upon the dead body, and demonstration of the anatomical practicability.

My own experience may be useful, although it is limited to operation upon four women, all of whom suffered from complete procidentia; and I will simply give a summary of their cases, inasmuch as a detailed account of each would be tedious and unnecessary. The ages were from thirty-three to fifty-three years; prolapse had existed from two to eight years, and pessaries were useless. The first case was operated upon on November 27th, 1882, when a prolonged search was made for the ligament on one side only, but without success, the wound taking nearly three months to cicatrise. It can be said with truth that little pain was caused, and no risk to life was in any way threatened, but the result was mortifying in the extreme, for, in spite of the rest in bed, the procidentia was as bad as ever. The case was, however, instructive, seeing that failure was, no doubt, due to fraying out the ligament instead of grasping it boldly; indeed, I came almost to the conclusion that there was no round ligament present. The tedious healing was accounted for partly by the handling the tissues had undergone, and partly by the patient being obese. I hope to induce her to allow me another trial upon the opposite ligament.

The second case was more encouraging, for the ligament on one side was quickly found, shortened, and stitched to the skin; but here again the wound was about two months before it was completely healed. She came for examination on June 22nd, the operation having been performed on January 1st. The cervix was two inches within the vagina. She "could go about much better," had "no bearing down pain," and no bladder-trouble; and this gain was produced with shortening one ligament only.

The third case was somewhat remarkable; for, although the ligament was readily found on one side, yet, when search was made at the same time upon the other, no trace of any ligament appeared. Again, slow healing followed with erythema and cellulitis of the abdominal wall, a high temperature, and dry tongue, etc., so that at the end of three months I was very glad to see the patient able to go out. The operation was performed on February 2nd, and on July 4th she came