

**Antiseptic dry-air treatment of consumption : a practical treatise dealing with the origin of consumption, how it can be prevented and successfully treated by rational and safe means / by John J. Hartnett.**

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OF  
CONSUMPTION.

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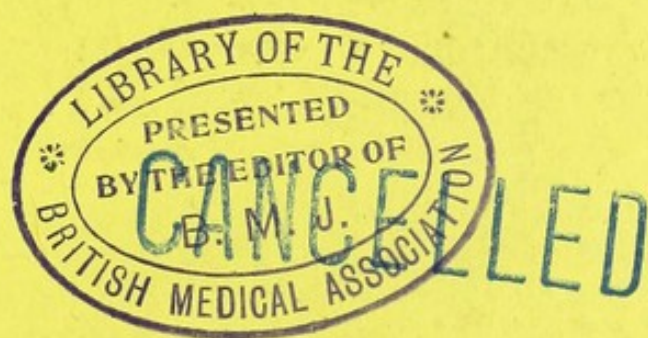
John J. Hartnett.  
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Antiseptic Dry-air Treatment

OF

CONSUMPTION

*A PRACTICAL TREATISE DEALING WITH THE ORIGIN OF  
CONSUMPTION: HOW IT CAN BE PREVENTED AND  
SUCCESSFULLY TREATED BY RATIONAL AND  
SAFE MEANS*

BY

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OF MEDICATED AIR FOR DISEASES OF  
THE THROAT AND CHEST."

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## PREFACE.

THE taunt frequently levelled at the present generation of medical workers, by the unthinking, that our knowledge of therapeutics has not kept pace with the more tangible branches of professional work, is not quite justified, even if we confine ourselves solely to the use of drugs, and is wholly unjustifiable when we consider that the science of Hygiene and Antiseptic Medicine, by which disease can be arrested, its cause removed, and infection prevented, are well within the province of the practising physician. The mere administration of drugs is no longer the limit of our so-called "healing art." How often do we not find those agents drawn from Nature's laboratory—pure air, hygienic surroundings, sunlight, and change of scene—or a well-regulated diet, sanitary clothing, a sufficiency of bodily exercise and mental relaxation, accomplish what physic fails to do?

Profiting by the experience of the past we now know that relaxing health resorts; inactivity of mind and body; unnecessary quantities of expectorant and other mixtures, injurious to the digestive system, avail little as curative agents in the treatment of P hthisis.



As pure an air as possible, high on the mountain's side, or in mid-ocean—untainted by the effluvia, dust, smoke, and living organisms to be found in the atmosphere of large towns—is now looked upon as the best cure for Consumption, especially in the early stages; and why? Simply because the air in its pure state is naturally antiseptic, low forms of animal life cannot live in it. High altitude health resorts, however, are within the reach of comparatively few, and are suitable only to a small percentage of those. The exhilarating effects of a rarefied atmosphere act injuriously on those of a nervous temperament, and the quickness of breathing with increased expansion of the pulmonary tissue to which the rarefied air gives rise is dangerous to patients suffering from hæmoptysis or rise of temperature.

A large proportion of cases recover in the Eucalyptus Groves of Australia, and in the Pine Woods of Colorado, and British Columbia. Again we find the *RESULTS DUE TO ANTISEPTIC CAUSES*—to the oxidising properties of the *terpenes* which the trees exude.

The system of Antiseptic Dry-air Treatment, herein advocated, brings home to patients an atmosphere resembling mountain air in purity, and that of Eucalyptus and Pine forests in its disinfecting and oxidising powers. By the constant practice of well-regulated respiratory gymnastics we obtain results similar to what takes place in high altitude resorts without any risk to the patient. The chest walls are



expanded, the lungs thoroughly ventilated, and an increased extent of surface exposed to the action of the germicidal air.

Briefly reviewing the life history of the *Bacillus Tuberculosis* and the effects of the bacterium on man : the theory of Phagocytosis and the behaviour of the amœboid cells in the presence of bacteria : the effects of Toxine, the potent poison which the bacilli excrete : the perversion of function and atrophy which takes place in the lungs of phthisical patients, I have endeavoured to explain the *modus operandi* of my treatment, and to demonstrate in a practical manner the *RATIONAL CURE OF Pulmonary Consumption*.

In support of the views advanced with regard to the spread of this disease, through living or sleeping in a vitiated atmosphere, and how all-essential pure air and sunlight are in the treatment ; I have quoted from Dr. B. W. Richardson on Impure Air ; Miss Florence Nightingale on Sunlight for the Sick ; and from Professor Ray Lankester on the excreta of Bacteria and their different effects.

Having observed hundreds of cases of Pulmonary Consumption, which might have been prevented, or cut short in the early stages ; and marked with regret the injurious and fatal effects of ill-advised climatic treatment on advanced cases, and the inexcusable ignorance of those hygienic rules whose observance acts so beneficially on invalids suffering from Consumption, I determined to add a chapter on Hygiene, Sanitary Clothing, and Food to my original paper



on the "Insufflation of Medicated Air for Diseases of the Throat and Chest," read at the general meeting of the British Medical Association at Birmingham, 1890, and issued in the form of a concise treatise. The favour with which it has been received, and the success which has attended my efforts with regard to the scientific treatment of Consumption have been so satisfactory, that I have added some fresh matter, chiefly on Mr. Kingzett's discoveries of the value of Peroxide of Hydrogen as a disinfectant, which (with the hints on *respiratory gymnastics*, *ocean travel*, and *health resorts*) will, I trust, add to the value of this brochure.

JOHN J. HARTNETT, M.D.

6, GROSVENOR STREET,  
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# ANTISEPTIC TREATMENT OF PULMONARY CONSUMPTION.

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## CHAPTER I.

### INTRODUCTORY REMARKS.

THERE are few subjects in therapeutics of graver import to the practising physician than the treatment of Pulmonary Consumption. The number and variety of "Cures" which have been advanced, together with the fact that many recognized authorities hold conflicting opinions on the curability of phthisis, and the advisability or otherwise of attempting any special treatment beyond the administration of tonics and wintering in one or other of the many health resorts recommended to consumptives, clearly show that this branch of medical science is still far from being in as settled and satisfactory a condition as we could wish.

Specialists who have made this disease a study know full well how difficult and perplexing the development of complications makes the collection of statistics, and how carefully cases must be watched



before exact conclusions can be arrived at. Oftentimes patients make considerable progress for a time, then, from some untoward event such as an attack of hæmoptysis, or a chill inducing pulmonary congestion, accompanied by constitutional disturbance, alarming symptoms suddenly supervene which, temporarily or permanently, retard convalescence.

To discuss the different views held by Laënnec and his determined opponent Broussais as to whether the lung disease in Phthisis is a local manifestation of a constitutional affection, or whether it is due to an inflammatory product "having the exact appearance and consistence of *fromage*," would serve no better purpose than to point out the great strides which pathological science, aided by the microscope, has made of late years.

The pathological difference between Acute Miliary Tuberculosis and Phthisis (due to infiltration of the small tubes and air cells of the lungs with caseous matter, the result of unabsorbed exudation after *Acute Catarrhal* or *Chronic Catarrhal Pneumonia*) should be constantly before the mind when treating this affection. Acute Miliary Tuberculosis, the most rapid and fatal form of the disease, depends on the presence of numerous colonies of bacilli embedded in the substance of the pulmonary tissue. The peculiar phase of constitution which predisposes to this affection offers but a feeble resistance to the inroads of the bacilli, whether they have been consumed with diseased milk or meat, or been inhaled in



quantities on to the raw and inflamed surfaces of the smaller bronchial tubes and air cells during an attack of Hæmoptysis or Acute Catarrhal Pneumonia.

*Chronic Catarrhal Pneumonia* is the commonest cause of the ordinary form of lung disease known as Pulmonary Consumption ; that is to say, a consolidation due to the exudation of cells in the alveoli of the lungs ; or a secretion abounding in cells, from chronic catarrh, extends from the smaller bronchial tubes to the alveoli. This constantly increasing accumulation (which continues during the slow and lingering course of the disease) brings about the obliteration of the alveoli and causes the cells to be so closely packed together that they become converted into a caseous or cheesy mass, which may ultimately be completely absorbed by fatty degeneration, or break down and form a cavity in the substance of the lung. This is the most curable form of Phthisis if taken in the early stage. Indeed, residence in a dry climate, or a long ocean voyage, with suitable diet, respiratory gymnastics, and anti-septic dry air inhalations, will effect a cure in a large proportion of cases ; that is, of course, if the patient be removed in time from insanitary surroundings and impure air, where bacilli abound.

Niemeyer remarked that "extensive consolidations and large cavities are compatible with a relatively good state of health, and that *the greatest danger most phthisical persons have to apprehend is the development of tubercles.*"



Tuberculosis is in many cases a secondary disease originating with and directly due to the inception of the living parasites—Tubercle Bacilli. That is to say, it is beyond question that the disease itself is *not transmitted* from parents to offspring, as is frequently supposed. The hereditary predisposition (the weak or vulnerable constitution dependent on the parents having been themselves the subjects of phthisis, syphilis, cancer, or other exhausting disease) is transmitted, and renders the offspring so delicate by nature that, though no innate phthisis exists, they are apt to fall victims to the disease. The tendency or predisposition to phthisis may be acquired, or the hereditary predisposition increased by such causes as insanitary surroundings, insufficient food, prolonged suckling, or any cause which lowers the system and depresses the vital powers.

In persons predisposed to consumption the growth in height is proportionately greater than the growth in breadth; the muscles are thin, flabby, and imperfectly developed; the finger nails have a peculiar appearance; the skin is thin; the long bones are slender, and the chest is badly shaped. People so constructed should be careful of even the slightest bronchial catarrh, and should build up the system by every means in their power, being thoroughly clad in warm woollen clothing *during winter and summer*, enjoying as much open-air exercise and sunshine as possible, and *always sleeping* in well-ventilated apartments. They should never marry, or at least wait



until they have passed the critical time of life, viz., nineteen to twenty-six, when phthisis is most apt to become developed; those who propagate their species and bring into the world a puny, delicate, and diseased offspring being, in the writer's opinion, accountable for a considerable amount of the misery and poverty with which we are surrounded.

The discoveries made by Pasteur and other bacteriologists of the living causes of disease have opened our eyes to the fact that if we wish to effect any good purpose our treatment must not be entirely symptomatic—merely treating the cough and other symptoms as they arise—but must be directed to the destruction and removal of the cause of the disease. Nearly ten years ago it was conclusively proved by Prof. Koch that the cause of pulmonary tuberculosis was the presence of rod-shaped bacteria—bacilli—in the lungs. These bacilli resemble animals in their requirements for food. While a plant will thrive on carbonic acid and ammonia, the bacilli must have nourishment consisting of the actual substance of the animal on which they live. They act on this food chemically by digestive juices, and, strange as it may seem, it is not to the existence of the bacilli themselves, so much as to the harmful substances they produce, that the mischief occasioned by their presence is mainly due. They do not take the food into their insides, but rather wallow in it, acting on it and digesting it as they multiply by millions. The poisonous impurities



or toxines which they throw off are at first expectorated from the lungs, but, afterwards, as the microbes sink deeper and deeper into the pulmonary tissue, become absorbed into the circulation, and produce the distressing train of symptoms—profuse expectoration, night sweats, and diarrhœa—which we recognize as peculiar to the second and third stages of pulmonary consumption.

Professor Ray Lankester, F.R.S., in a recent popular article graphically describes what the excreta of bacteria and their effects are like :—

“All bacteria are not alike in their requirements as to food and in the substances—variously smelling, variously coloured, poisonous or harmless, liquid or gaseous—to which they give rise ; just as some animals are herbivorous, some carnivorous—as some produce musk, some ambergris, others venom, others wax, and so on—so do we find variety in this invisible world, rendered visible only by the modern microscope. There are kinds—species as the naturalists say—of bacteria as distinct from one another as the cow and the skunk. The commonest species are those which live on ordinary vegetable and animal refuse. They make a good deal of disagreeable smell, but there is not much harm in them, and, like the manufacturing chemists, who, next to bacteria, are of all beings the most offensive to the olfactory sense, they perform valuable service by manufacturing soluble ammonia and nitrates (the food of green plants) from the viscid and solid



carcases which once were living. Many distinct species are known which are thus busy—one stage of the process being performed by *Bacterium termo*, the commonest of all, and *Bacterium lincoli*, *B. dichotoma*, *B. subtile*, and others, while *B. ureæ* produces ammonia in the course of its operations (witness the stable-yard), and *B. nitrificans* (only just lately isolated and studied experimentally) converts ammonia into nitrates and nitrites, carrying on its work everywhere in the soil and preparing it for the growth of plants.”

“We are indebted for vinegar to the chemical activity of *Bacterium aceti*, which grows on the wicker-works of vinegar factories and oxidizes the alcohol provided by the vinegar manufacturer into acetic acid ; and we have to thank another bacterium for the butyric acid which gives its flavour to cheese. Without these bacteria we should have no vinegar and tasteless cheese. The phosphorescence—not of the sea—but of dead fish, bones, and rotten wood, is due to a bacterium which, in the course of its chemical operations having as their end its own nourishment, produces a peculiar substance, which is oxidized with the production of light but little heat. Some bacteria startle mankind by the brilliant colours they produce, in a wanton sort of way, not apparently because the colours are of any use to them, but just as a by-product of their digestion. All the milk in a village is turned blue, not like the blue of London milk, but a fine ultramarine, by the sudden growth



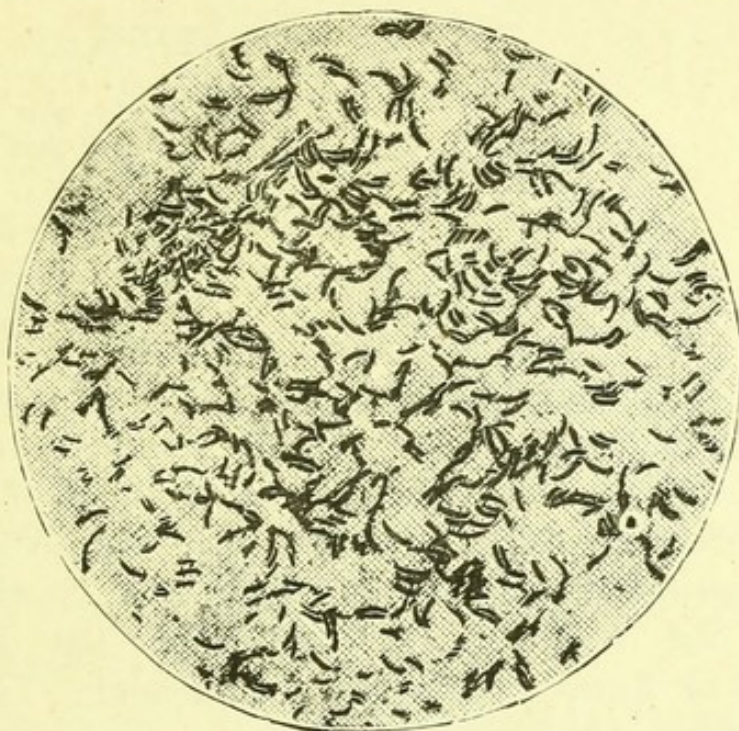
in it of the *Bacterium cyanogenum*; another makes the pus of ill-dressed wounds assume a beautiful emerald-green colour, and others cause red, yellow, and violet tints to appear where least expected.”

Every surface teems with them; all natural waters are infested by them; even the skin of the most washed of mankind, even the moisture of the sweetest mouth harbours them by the million.

Many varieties of bacteria are constantly being taken into the system, but they and their products have little or no effect on man. It is with that particular form of bacterium, the *Bacillus Tuberculosis*, and the toxine which it produces, that we have to deal in considering the best, safest and most expeditious manner of destroying the parasite, when embedded in the soft structure of the lungs, and thereby curing the disease—Pulmonary Consumption—to which it gives rise.

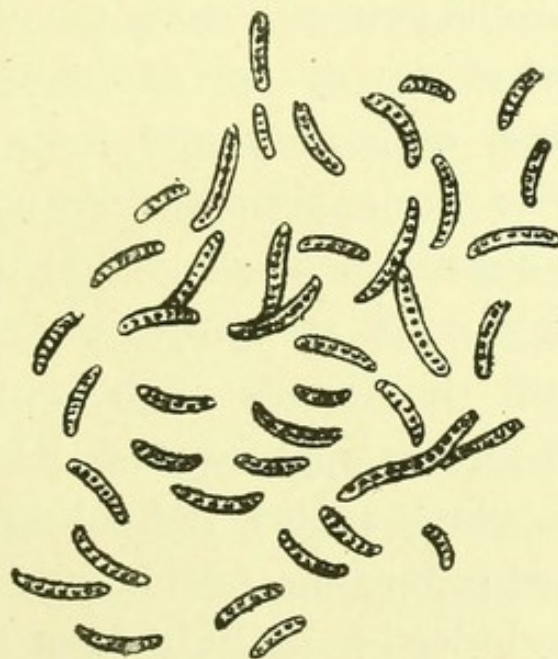
While threatened epidemics of cholera and fevers, for the time being, upset the equanimity of “the powers that be,” this infectious disease seems to be tolerated, and, because of past failures to eradicate the scourge, to be looked upon as hopelessly incurable. I shall endeavour to point out how puerile and erroneous such reasoning is, and how, as a matter of fact, the mortality from Consumption (which outnumbers that from any other disease<sup>1</sup>) can be considerably lessened.

<sup>1</sup> The Registrar-General's report for 1890 shows a death rate from Consumption of 48,366 in England and Wales, 10,176 in Ireland, and 7660 in Scotland.



*CLUSTERS OF TUBERCLE BACILLI.*

(As seen when cultivated on blood-serum.)



Enlargement of the above.



## CHAPTER II.

The Cause of Pulmonary Consumption—A Disease of Civilized Life—Communicated from Man to Animals and from Animals to Man—The Bacillus Tuberculosis—How the Disease Spreads—Why Some People are Attacked—The Greatest Safeguard against Consumption—Destruction of the Bacilli a Complete Cure—The Error of Delay—The Early Symptoms—Symptomatic Treatment Worse than Useless—The Primary and Secondary Causes—Volatile Germicidal Inhalants.

THE successful and scientific treatment of Consumption depends on the correct conception of its etiology. In a blind sort of way our predecessors stated that Consumption was hereditary, and for a time would listen to no other explanation of its causation.

Whilst it would be idle to deny that children born of consumptive parents are prone to fall victims to the disease, still the theory of heredity does not always account for its appearance. Peculiar phases of constitution which render individuals susceptible to the attacks of organisms, visible only through the microscope, are indeed hereditary ; but the time has come when we must free ourselves from the trammels of an obsolete theory and bring our minds to bear upon this subject from a broader standpoint.



Consumption is a disease peculiar to civilized life, and its spread is the outcome of our so-called civilization. Savages who lead an open-air, vigorous life do not suffer from Pulmonary Consumption; amongst the Maoris, the Zulus, and the North American Indians it was almost an unknown disease *until the introduction of civilization.*

That it is communicated from man to animals and from animals to man, by the inhalation of spores and germs to which it is due, the consumption of tuberculous meat and milk, and by inoculation, has been conclusively proved.

It is to badly-ventilated, insanitary homes, to confined bed-chambers and overcrowding, with insufficient breathing space and defective ventilation, that the spread of this scourge of modern times is mainly due.

The germs are harboured in crevices and corners of unclean rooms, in the carpets and curtains of insanitary houses, where pure air and direct sunlight seldom enter, and undoubtedly cause the spread of consumption from one member of a family to another, as surely as the germs of typhus, scarlet fever, and other acute febrile affections do.<sup>1</sup>

The specific germ to which Pulmonary Consumption is due is the *Bacillus Tuberculosis*, a rod-shaped bacterium of an elongated form, found in the diseased parts of men and animals suffering from Tuberculosis. (*See page 17.*)

<sup>1</sup> See facts recorded by Dr. B. W. Richardson, and cases by the author, Chapter VI.



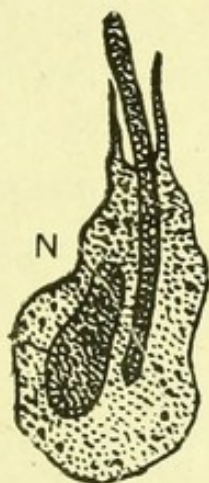
Why, it is often asked, if Consumption is due to the presence of bacilli, is it that some people "take" the disease whilst others do not, or why does it "run" in some families, and seem to be hereditary, whilst persons living in the same district, perhaps in the same house, are seldom or never attacked? The important discovery made by Carl Roser and worked out by Metschnikoff, the Russian zoologist—to whose ingenious and fertile experiments we owe much of our knowledge of phagocytosis—that the white cells, the amœboid corpuscles of the blood, possess a peculiar property of picking up and dissolving, or else ejecting foreign particles and even those living active micro-organisms which find their way into the circulation, goes far to supply an important answer. He called these corpuscles "*phagocytes*" on account of the properties they possess, and showed that they act on the bacteria in this peculiar way, and are in reality the scavengers of the system, and particularly of the more delicate structures of the body.

From his researches and observations he arrived at the conclusion that it is war to the knife between the phagocytes and bacteria when they meet in the blood, and pointed out that recovery from a bacterial disease means the triumph of the phagocytes, whereas, if death ensue, the bacteria have overcome the phagocytes and poisoned the whole system with their excreta.

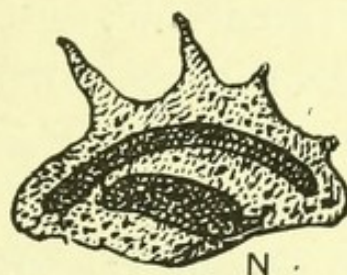
The amœboid corpuscles are very plentiful in the healthy system, both in the blood and in the various tissues of the body, and undoubtedly act as the



defenders of the more delicate structures against the inroads of bacteria. It must not be imagined, however, that these phagocytes stand like sentinels on guard waiting for the micro-organisms to appear in the blood; on the contrary their food and very



Phagocyte in the act of engulfing a bacterium.



The same, as seen when the bacterium is completely engulfed.

N marks the nucleus or central part of the phagocyte.

NOTE.—Taken from the web of a frog's foot after injection of anthrax bacteria.

existence depend on the power of assimilating particles of degenerating muscles, bacteria, &c. When, however, from hereditary taint or debility, induced by any cause—such as poor living, typhoid fever, excessive and exhausting work in badly ventilated rooms—the system is so lowered that the phagocytes are abnormally scarce, then the subject becomes predisposed to consumption; that is to say, supposing a number of bacilli are inhaled, and find a resting-place on a patch of congested lung tissue, the soil is, so to speak, ready to receive them; the phagocytes, or natural scavengers, not being in sufficient force,



through the debilitated state of the blood, these bacilli take root, and multiply in such numbers that the individual soon develops the symptoms of pulmonary consumption.

The presence of an abundance of the amœboid cells in the blood is the greatest safeguard against consumption, and to my mind their absence would, in a great measure, account for the hold phthisis takes on those fair-haired and clear-skinned people who undoubtedly inherit constitutions predisposed to the disease.

To prevent the spread of Consumption and effect a cure when it has taken hold of the system, we must always remember

1st.—That the disease *is not directly transmitted*, that is to say, tubercles have never yet been found in the new-born child.<sup>1</sup>

2nd.—That it depends on a predisposition which most frequently *is hereditary* but which *may be acquired*.

3rd.—That, though the individual may be ever so much predisposed to Consumption, the disease cannot become developed without the presence of the exciting cause—Tubercle Bacilli—in the lungs.

We have, therefore, first to deal with the predis-

<sup>1</sup> It was recently reported in the *Lancet* that bacilli were found, for the first time on record, in the umbilical cord, after the removal of an eight months' fœtus from the uterus of a woman who had died of Acute Miliary Tuberculosis; but no tubercles could be found in the brain, lungs, or mesenteric glands of the fœtus.



position to Phthisis, for it is evident that if the individual be not predisposed to the disease the exciting cause cannot take effect, for the system will be possessed of sufficient inherent vitality to resist the bacilli.

The predisposition may be *Hereditary* or *Acquired*.

*The hereditary predisposition* is to be found in persons born of consumptive parents, especially of consumptive mothers (and to a still greater degree when those mothers have suckled their offspring); and of individuals who are weak, sickly, or badly nourished. In a large proportion of cases, the hereditary predisposition can be overcome by careful attention to hygienic and dietetic rules: viz.—

*Nutritious Diet.—Muscular Exercise.—Outdoor Sports.—Pure air.—Warm sanitary woollen clothing.—A dry home to live in.—Well-ventilated apartments to work and sleep in; and complete isolation from all cases of Pulmonary Tuberculosis.*

The parents and guardians of children so predisposed, the managers of schools, and those in authority in public and private institutions where children—and more especially the children of the poor—come under their charge, are morally responsible for their physical as well as their mental development. Under proper medical supervision, the hygiene of the lungs should be daily attended to, and a well-regulated system of respiratory gymnastics (Chap. IV.) thoroughly carried out.



The predisposition may be *acquired* by—

1. Irregular living.
2. Insufficient and poor diet.
3. Prolonged exposure to damp.
4. Sleeping in badly ventilated rooms.
5. Living in damp, insanitary homes.
6. Spending the day in overcrowded, badly ventilated schoolrooms, workshops, factories, &c.
7. A sudden congestion of the pulmonary tissue, such as frequently results from leaving a crowded ball-room for a balcony, when the body is overheated, and the circulation quickened, with the chest exposed to the cold night air.
8. Mental depression, excessive worry, long continued suckling, typhoid fever and its after-effects, or, in fact, any lowering or debilitating disease.
9. Catarrhal affections of the smaller bronchial tubes, especially the affection known as *Chronic Catarrhal Pneumonia*, where from excessive exudation the cells are deprived of their covering of ciliated epithelium, the province of which is to guard the alveoli, or delicate pulmonary air cells, against the inroads of foreign particles of matter, living bacteria or germs floating in the air.

THE EXCITING CAUSE of pulmonary tuberculosis



(and without which it cannot occur) is the presence of the microscopic parasite—the *bacillus tuberculosis*.

The bacilli are micro-organisms of a rod-shaped appearance, about the  $\frac{1}{10000}$  of an inch in length. They are dotted along their bodies (*see page 17*) and reproduce themselves with marvellous rapidity, multiplying by millions in a comparatively short space of time. They are thrown off from the diseased pulmonary tissue with the dead epithelial cells, mucous secretion, and pus, which generally combine to make up the expectoration or sputa of the consumptive invalid. Here lies a fact of the greatest importance, and of which we must never lose sight, *both with regard to the prevention and cure of Phthisis*.

These bacilli, when harboured in the crevices of unclean rooms, carpets, and pocket-handkerchiefs; deposited on pavements or gravel, or carelessly thrown on to dust-heaps when emptying vessels into which patients have expectorated, become a potent source of infection. When the moisture of the expectoration evaporates, and the organic particles become decomposed, the tubercle bacilli and other forms of bacteria are left attached to small particles of dust and become dispersed through the air when carpets are brushed or shaken, when dust-bins are being emptied, or when the dust of the pavement is blown about by the wind.

Their inhalation on to a patch of raw pulmonary surface by an individual having a vulnerable con-



stitution predisposed to the disease is the starting-point of the affection known as Pulmonary Tuberculosis.

It is very evident, therefore, that the destruction of the sputa of consumptive invalids is a matter of vital importance, both for the sake of the patient (who, in all probability, will inhale into another part of his lungs the very bacilli which have been expectorated, if the sputa be not completely destroyed) and for other individuals predisposed to Consumption. Patients should never carelessly spit about, even on the roads.<sup>1</sup> All pocket-handkerchiefs used by them to expectorate in, should be burnt, if old ones, or well boiled in the process of washing, and spittoons or sputa cups, when used, should contain strong carbolic water or "Sanitas" fluid, and the contents emptied into the closet-drains.

Consumptive mothers should never suckle their children, both for their own sakes and to avoid transmitting the bacilli direct to the child through the tuberculous milk. Little babies thus reared get tuberculosis of the mesenteric glands of the abdomen, and die young or become chronic and worthless invalids.

The destruction of the bacilli in the early stages of the affection produces a rapid and complete cure. To play with a case until it has taken firm hold of the

<sup>1</sup> A forcibly interesting case has been recorded in the *Lancet*. The caretaker of a poultry farm, who suffered from Acute Phthisis, expectorated freely on the ground when attending to his duties. *Every fowl on that farm died of Tuberculosis through pecking at the sputa.*



system would indeed be culpable, when a rational method of treatment, entirely free from risk, can conclusively be demonstrated.

To wait until the lungs are riddled with small cavities ; until the entire system is poisoned with the excreta given off by the bacilli, producing night-sweats, diarrhœa, etc., or until the ulcerative process has eaten its way perchance through one of the pulmonary blood-vessels, and then hope for a rapid or certain cure, would be as irrational as to expect a physician to supply one with a pair of new lungs. We are but human, and must work by human means. The more highly organized we are the greater penalties we have to pay, both physically and mentally, for our high organization.

The surgeon who prevents a gangrenous process from extending, and gives nature a chance of repairing the diseased structures, has done well for his patient. In the same way, once a portion of lung tissue is diseased or dead, we are doing well if we can arrest the progress of the ulcerative process, and bring about a repair of the tissues. From the first we must treat consumption, not as a constitutional disease, having the lung trouble as a local manifestation, but rather as a purely local affection of the lungs, induced by the presence of a microscopic parasite which thrives best on a moist substance, at an equable temperature of about 100 degrees Fahrenheit, and away from all sunlight.

Such a condition is to be found to perfection at the



termination of the smaller bronchial tubes, where they spread out into soft vascular lung tissue—the pulmonary air cells—which are little more than a network of minute capillaries covered over with a layer of delicate epithelial cells, so as to allow of the egress of carbonic acid from the blood and the ingress of oxygen from the air. Here the bacillus alights on a patch of pulmonary tissue, perchance congested or inflamed. It is inhaled perhaps in a half-dead condition, but the warm blood with which it comes in contact soon restores it to animation and activity. It finds a home congenial to its tastes, and begins to multiply by hundreds, thousands, millions, and nonillions. At first the effects on the system are but slight. There is a depression of spirits—as if nature were conscious of the presence of a secret foe—a loss of appetite, a short hacking cough, with little or no expectoration. Examination reveals a slight dulness on percussion, and the stethoscope conveys to the ear the characteristic sounds which once heard are never to be mistaken.

At this stage of the disease we have before us an individual, into a cul-de-sac of whose lung some parasitic microbes (tubercle bacilli) have been inhaled with the air, perhaps in a ball-room, at the theatre, in a badly-ventilated sleeping apartment, or by the bedside of a dying relative, a slight congestion or hæmoptysis rendering the pulmonary tissue suitable for their reception. To free the lung from these microbes would be to cure the patient; but, how?



Surely not by sending him home and prescribing a mixture of squills, ammonia, digitalis, syrup and ipecac. ; not by confining him to his bed in an apartment perchance too small, badly-ventilated and devoid of direct sunlight, paying little or no attention to diet, applying a slight counter-irritant to the apex of the affected lung and casually visiting the patient. THAT is *how not to cure*, or even to arrest the progress of the disease, as the records of the hundreds of thousands who have fallen victims to Pulmonary Consumption clearly show.

The symptomatic treatment of this disease is worse than useless ; it prolongs the patient's misery, but does not effect a cure. To allay the cough by prescribing a morphia mixture ; the hæmoptysis by a sub-cutaneous injection of ergotine ; the night-sweats by mineral acids, and the diarrhœa by prescribing astringent mixtures, is not the true end of scientific medicine. The basis of sound therapeutics must be above all *to attack the cause of the disease and destroy it*.

In the treatment of Consumption we must, therefore, bear two points in mind :—

1st. The hereditary or acquired predisposition characterized by the scarcity of phagocytes in the blood.

2nd. The exciting cause—the presence of microscopic parasites, bacilli, in the lungs.

An insufficiency of phagocytes means an abnormally thin and impoverished condition of the blood,



a state of things to be found amongst clear-skinned anæmic individuals. To remedy this we must build up the system by every means in our power, and, as will subsequently be pointed out, this can best be done by supplying such nutritive substances as can readily be assimilated and on which the phagocytes increase and multiply.

The destruction of the bacilli, it must be remembered, is our chief aim ; for if these be not exterminated, all hope of permanently curing the disease comes to an end. To reach those small microbes buried away in the most remote recesses of the lungs is the problem we have to solve. Experience has taught us that the numerous medicines and substances which have from time to time been prescribed to be taken into the stomach or introduced into the blood have little or no effect on the bacilli. Creosote is the only preparation of any repute for that purpose ; but, alas ! this, more often than not, fails to be productive of any good result, and, as a matter of fact, is a preparation which many people cannot take, on account of the peculiarly disagreeable eructations to which it gives rise. How then are we to reach the bacilli and destroy them ? The very elements of physiology teach us that air, and nothing but air, is allowed to pass through the smaller bronchial tubes and reach the lung cells. Even small particles of moisture, spray, or the very finest powder floating in the air does not pass much beyond the second or third bifurcations of the bronchial tubes. Nature provides a special arrange-



ment of ciliated epithelial cells lining the trachea and larger tubes, with that special object. The cilia with which these cells are covered are constantly in motion, always waving towards the opening into the larynx. Their action has been likened to that of a field of ripe corn when acted on by a gentle wind. The dark-coloured expectoration which one notices after travelling in smoky tunnels like the Metropolitan and District Railway in London is an example of how well and carefully these tiny hair-like processes do their work, extracting all the foreign particles in the atmosphere before it reaches the air-cells.

We must therefore take a lesson from nature, and not attempt to reach the bacilli in the air-cells by means of air charged with fine powder, spray or medicated steam. There are certain preparations which are volatile—that is to say, they impregnate the air with their peculiar properties without being materially appreciable, and pass with the oxygen through the ramifications of the bronchial tubes, coming directly into contact with the pulmonary cells. Some of these volatile preparations are germicidal in their action—they destroy bacteria and disinfect the poisonous excreta given off by them. There are several at our command which vary in their volatilising power and in their germicidal action. Some deodorise the air, but have no action whatever on the germs. Others, again, though their deodorising power is not great, possess remarkable properties as germicidal agents. Guaiacol, Menthol, Sanitas,



Iodoform, Eucalyptus, Terebene, and Pine Extracts are foremost amongst those agents. Drugs like carbolic acid, though possibly of value as germicides where they can be applied, are of little use to us in the treatment of consumption, their volatilising power being low and their power of oxidation *nil*.

Some valuable experiments have recently been made by Dr. A. Irsai, which prove that medicated inhalations act differently on the vaso-motor system of nerves, in some cases producing hyperæmia, in others anæmia of the pulmonary tissue.

Turpentine and the Terpenes generally, produce an anæmic or bloodless condition of the lungs, and therefore will be found most valuable as important agents for checking hæmoptysis or blood-spitting—that most troublesome and dangerous complication of Phthisis—which is invariably due to a hyperæmic condition of the pulmonary mucous membrane in the first or inflammatory stage of consumption. Creosote, Guaiacol, Oleum Thymi and Thymol, on the other hand, produce a redness or hyperæmia ; so that when we have tubercular, non-vascular deposits, Fitroid Phthisis or other thickening of the pulmonary tissue, where the supply of blood and the nutrition of the affected portions of the lung are defective, these inhalants, which induce hyperæmia, should be used.

They increase the blood supply through their action on the vaso-motor nerves, besides acting as powerful antiseptic and germicidal agents. Due vigilance must therefore be exercised in employing Creosote or



Guaiacol in cases where there is any tendency to hæmoptysis, and their use discontinued immediately it manifests itself.

The excreta of the bacilli is rich in toxine (the tuberculine of Koch), a poisonous substance which they throw off as a result of their digestion. Just as vinegar is due to the activity of the *bacterium aceti* which grows on the wicker-works of vinegar factories and oxidises alcohol into acetic acid, so the bacilli in the lungs produce, as a result of their activity and digestion of the blood and tissues on which they live, an excretion, toxine, which acts on man and the generality of animals as a potent poison, giving rise to night sweats, diarrhœa and general wasting of the system, in fact, to the symptoms characteristic of the disease known to medical men as Pulmonary Tuberculosis.

The cure of this disease must therefore depend on—

1st. The complete destruction of the bacilli.

2nd. The disinfection or purification of the toxine which they throw off, so as to render it harmless to the system, whilst the bacilli are being destroyed by the phagocytes from within and volatile antiseptic inhalations from without.

3rd. Development of the unaffected regions of the lungs, so as to compensate for the functionally weak, or useless diseased patches.

The importance of attention to the respiratory



functions cannot be over-estimated. When portions of the lungs are diseased their functions are, for the time being, paralysed, with the result of increased work being thrown on healthy parts, so as to effect the normal oxygenation of the blood and the elimination of carbonic acid. Therefore, whilst we are directing our attention to the destruction of the bacilli and the best means of producing an *aseptic* condition of the toxines, the further development of the non-affected portions of the lungs, by a system of respiratory gymnastics (see Chapter IV.), the introduction of oxygenated as well as antiseptic air into the respiratory passages, and the observance of due precautions for the escape of vitiated air (so that the carbonic acid and impure exhalations shall not be inhaled over again), must form an essential and all-important part of this or any system of treating Consumption which claims to be scientific and rational.<sup>1</sup>

<sup>1</sup> Professor Victor Horsley, in his opening remarks on Pathology at the recent General Meeting of the British Medical Association at Nottingham, wisely remarked:—"It does not seem to be generally appreciated that what is required at the present day is the accurate determination of the aberrations of normal function." . . . "To take a concrete example, the vast range of diseases of the respiratory functions. What a mass of facts has been accumulated in elucidation of the various changes in the structure of the lungs produced by pneumonia, phthisis, &c. ; but how many workers have been found to investigate the degree and effect of the loss of the respiratory function, of the disorder of the normal oxygen and carbonic acid ratios ! Yet this is what kills, this is the whole work of the disease, and this is what must be solved before the treatment of such diseases can be worthy of mention other than as mere empirical palliation."



## CHAPTER III.

### ANTISEPTIC AIR.

The most rational means of reaching the Bacilli—Imperfect Inhalation Systems—Medicaments from Steam Inhalers never reach the Lung Cells—The most Volatile Inhalants—Sanitas Oil—Insufflation of Antiseptic Air—The Antiseptic Dry-Air Exhaler—Its Advantages—Directions for Use—For promoting Strength and Clearness of the Voice—Disadvantages of London Air—How to Preserve the Voice and keep the Respiratory Passages healthy—The Author's Pocket Inhaler.

BEARING in mind the peculiar situation of the microbes in the air cells at the termination of the bronchial tubes, and the fact that nothing but air reaches thus far into the lungs, it must at once be apparent, even to an obtuse mind, that the most rational means of reaching the bacillus in its new home is by charging the air with some volatile preparation in which it can be demonstrated that the microbes cannot live.

This opens up the question of inhalation. I have been told that inhalations have been tried, and have failed to cure pulmonary consumption. This, however, is only partially true. Up to now, the system of inhalation practised, even at our leading institutions specially maintained for the treatment of



consumption, has been so imperfect, that it has deservedly fallen into disrepute. The inhalers have generally been tin kettles or earthenware jars with pipes attached for giving off steam, medicated by the addition of a little carbolic acid or creosote. Steam as a means of conveying medicaments to the respiratory tract in cases of pulmonary consumption is utterly useless ; for the watery vapour is condensed, and the medicament is left deposited in the trachea and larger bronchial tubes, long before the air has reached the smaller ramifications of the tubes or the lung cells. Besides, the warm moisture of steam is rather favourable to the development of the bacilli. Medicaments given off from spray producers share the same fate, and are mostly deposited on the pharynx. Therefore, in treating consumption, we must discard every form of apparatus, or so-called inhaler, which gives off steam, watery vapour, or spray in any shape or form.

Again, when we come to consider the inhalants in use, we find first on the list carbolic acid. Now carbolic acid put on an ordinary dry inhaler or respirator simply remains there, that is, to a very great extent, for it is but sparingly volatile at the ordinary temperature of the atmosphere. Dr. Hill Hassall has proved that a very large proportion of both carbolic acid and creosote can be recovered from dry inhalers, even after they have been in use for days. To thoroughly charge the air we must use inhalants more volatile than creosote or carbolic acid.



The introduction of Menthol, Eucalyptol, Pinol, Guaiacol, Terebene, Myrtol, Sanitas Oil, Iodoform, etc., has quite revolutionised inhalation treatment, and with more perfect dry inhalers we are now able to accomplish most satisfactory results.

These volatile medicaments impart to the air antiseptic, oxidising and healing properties, which render them invaluable agents in the treatment of pulmonary consumption, bronchitis, and asthma. We find, however, that to be productive of any good results in the treatment of laryngeal, bronchial, or pulmonary affections the inhalation of medicated air must be constant; that is to say, the patient must practically live in an atmosphere charged with the inhalant when indoors, and use a pocket inhaler as much as possible out of doors. To charge the sleeping and other apartments by night and day with dry medicated air, I force the atmosphere by means of a small fan through a medicating chamber, in which the volatile inhalant is placed. By this means not only are all noxious exhalations absorbed, but a free blast of antiseptic air is given off (see page 40), and the atmosphere indoors kept pure and charged with the inhalant. The volatile bacillicide, which I recommend, is largely composed of the medicaments above mentioned together with Sanitas Oil,<sup>1</sup> prepared, as explained by Mr. Kingzett in his work on "Nature's Hygiene," by the atmospheric

<sup>1</sup> Dr. Weeks has shown that it destroys the vitality of the *Staphylococcus Pyogenus Aureus* (the microbe of pus and boils) and the *Typhoid Bacillus*.



oxidation of Terpenes, such as the Oils of Turpentine, Eucalyptus, and Camphor. The atmosphere, in a dry state, can be thoroughly saturated with this excellent inhalant, which is volatile, pleasant to inhale, germicidal in its action, and undoubtedly possessed of great healing properties when brought into contact with the diseased pulmonary tissue.

To produce a thoroughly antiseptic condition of the atmosphere is the great problem to be solved in the treatment of consumption. Wherever human beings are congregated together, there we find vitiated air—an atmosphere with a reduced proportion of the normal oxygen; supercharged with carbonic acid and moisture, exhaled from the lungs and excreted by the skin; containing small quantities of ammonia, sulphuretted hydrogen, sulphurous acid gas, floating organic particles, and sometimes living bacteria. The most elementary works on physiology teach us this, and, furthermore, point out that each individual imparts such poisonous properties to the air that it becomes unfit for respiration, even when untainted by the exhalations of others. Persons sleeping in bed-rooms with insufficient cubic space and imperfect ventilation, those employed in banks, factories, and large offices, especially in winter when windows are closed and gaslight used throughout the day: those attending large assembly rooms, theatres, crowded ball-rooms, and overcrowded churches, are deprived of the normal amount of oxygen required for the oxidation of the blood, and



inhale an atmosphere overcharged with moisture and rendered poisonous to human beings by the organic and other impurities contained in the air. When this state of things is to be found amongst an assemblage of healthy individuals, how much more is the vitiated atmosphere exhaled from the lungs of consumptive and other invalids to be feared and avoided.

The inadequate means for the removal of vitiated air provided by doors, windows, and other imperfect systems of ventilation, becomes painfully apparent to those who frequent theatres and crowded halls *by the feeling of weariness generally accompanied by headache which is experienced.*

In this country the humidity of the atmosphere out of doors is often in excess of that within. Therefore admitting so-called fresh air charged with fog and smoke is but a questionable means of remedying the evil.

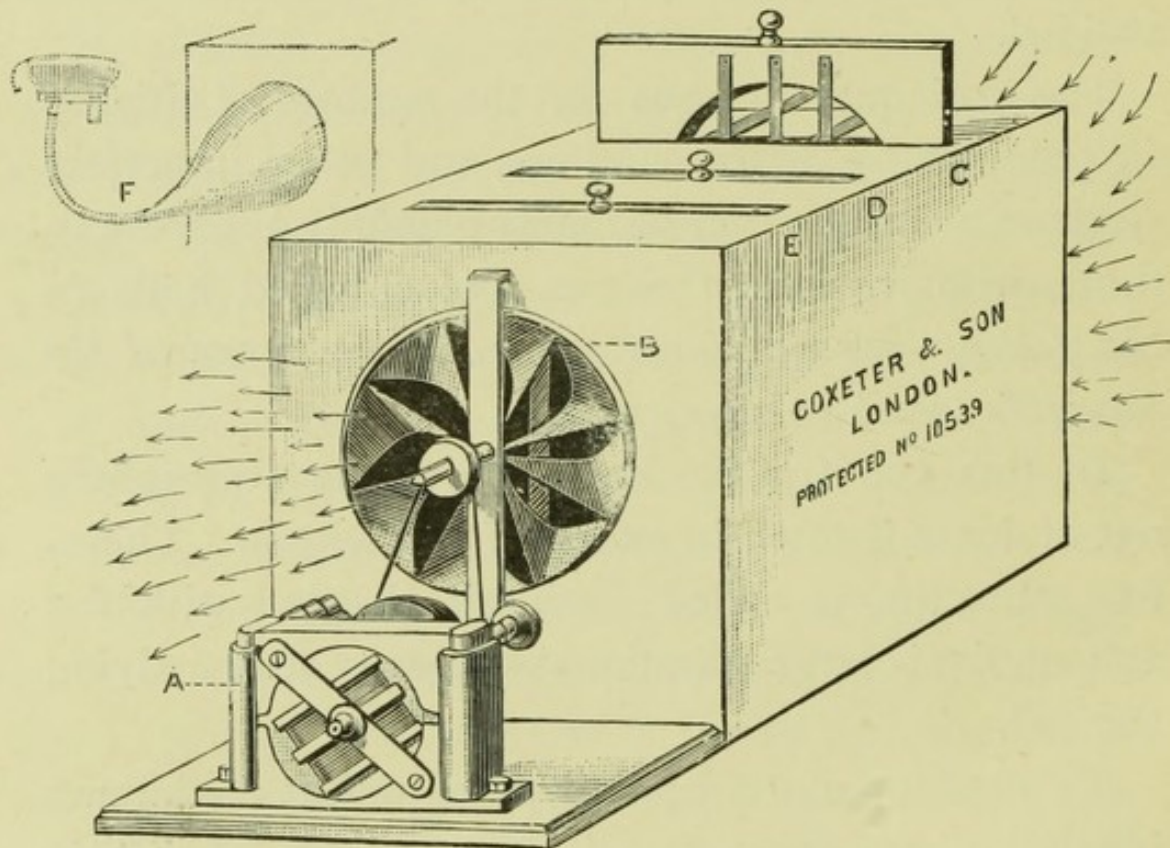
To render an atmosphere pure and fit for human inhalation, we must free it from excess of watery vapour as well as of carbonic acid and other impurities, in fact we must filter and dry the air. To effect this purpose without superheating the atmosphere and producing the hot dry air of the Turkish bath is the problem to be solved.

The views expressed on the subject of antiseptic dry air in a paper, read before the Laryngological Section of the British Medical Association at Birmingham, 1890, by the author, have been successfully carried



out in practice through the manufacture of *THE ANTISEPTIC DRY AIR EXHALER* (Fig. 5), then suggested. This apparatus is so constructed that it dries and filters the air and impregnates it with volatile medicaments which impart to the atmosphere oxidising and antiseptic properties—equal to, if not

Fig. 5.



ANTISEPTIC DRY-AIR EXHALER.

(Designed by the Author.)

A, Electro-Motor; B, Fan; C, D, E, Medicating slides; F, Cone and face-piece for direct inhalation.

exceeding, those to be found in pine and eucalyptus forests—due to action of the therpenes, which the coniferæ exude.<sup>1</sup>

Apart from the special treatment of Pulmonary

<sup>1</sup> The cone with face-piece (Fig. 5, F) attached can be fitted on the exhaler when used for direct inhalation.



Consumption, for which the writer devised this apparatus, it cannot fail to decrease the death rate and improve the public health, if used in the wards of fever and other hospitals, in theatres, churches, public schools, overcrowded halls, in the tunnels of mines, and in the confined cabins, state-rooms, and engine-rooms of large steamships ; the excessive moisture, carbonic acid, and other atmospheric impurities are absorbed in the filtering and hygroscopic chambers, and a constant blast of dry air is given off and rendered antiseptic by the hygienic properties of the pine, eucalyptus or other volatile essences with which the instrument can be charged.

Thus is produced an atmosphere pure, dry, and antiseptic without risk of a chill through admitting cold and damp air from without.

From force of circumstances and other causes many patients will be obliged to carry out the treatment in their homes, where this antiseptic air purifier will not be procurable. The Pulmonary Insufflator, which I have devised, is a portable instrument and improved inhaler, which not only does the work of medicating the air, but also forces it into the respiratory tracts during inspiration.

The following extract from my Paper on the "Insufflation of Medicated Air," contains a description of this instrument.

The therapeutic value of volatile medicaments in the treatment of diseases of the respiratory organs being now established beyond all question, and the



beneficial results accruing from their administration in such serious lung diseases as Asthma and Phthisis being fully recognized, we only need some form of appliance to facilitate the introduction of those valuable preparations into the bronchial tubes and lungs to enable us to derive still better results from their use.

The compressed air inhaler or pulmonary insufflator which I have *devised*, is an instrument which possesses many advantages over the ordinary inhaler, and which supplies to no small extent those important features which should be the recommendation of a good apparatus for the introduction of volatile medicaments into the respiratory tract.

The chief advantages in its favour are that—

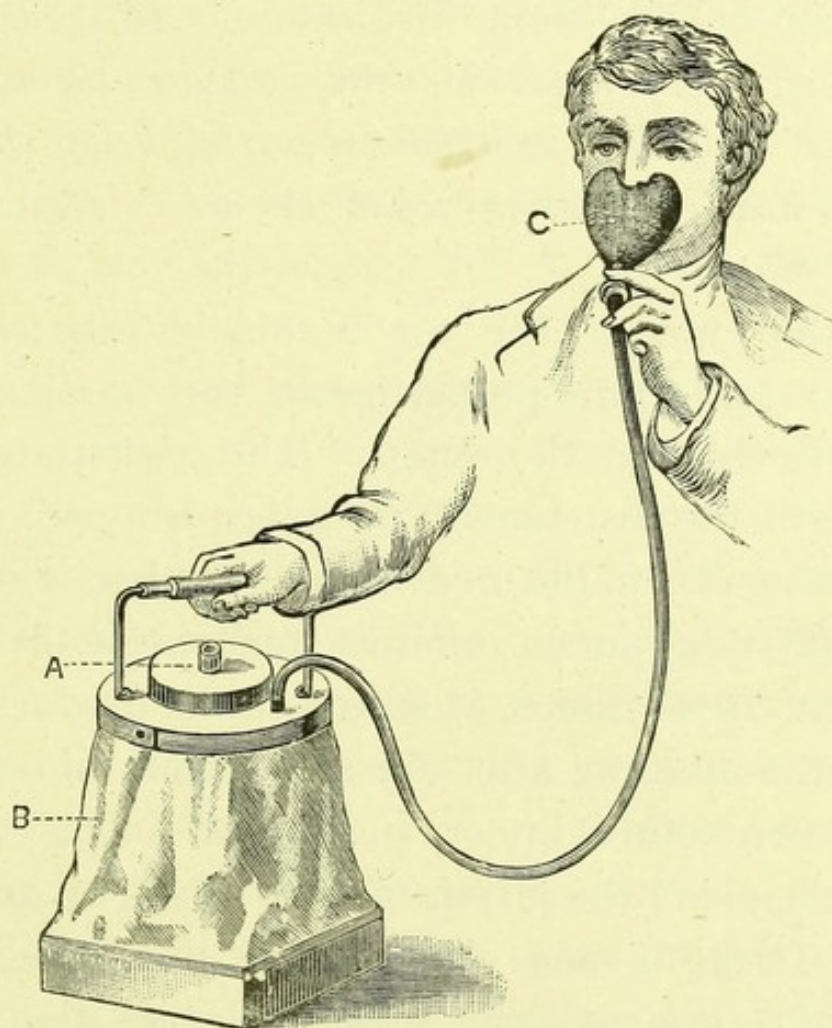
By compressing the pneumatic chamber a draught of air is forcibly drawn through the fluid contained in the medicating chamber, and is blown from the face-piece into the respiratory tract, without any extraordinary inspiratory effort on the part of the patient. It will be at once apparent that this is an enormous gain, not only in ordinary cases of throat and chest disease when invalids find inhalers fatiguing to use, for it must be borne in mind that these instruments are not ordered only for a few minutes, then to be put aside and taken up again, according to the whim of the patient, but rather are intended for constant use until they afford relief. Therefore I recommend this apparatus (which so to speak does the work of medicating the air and saves the patient the fatigue



of sucking or drawing it through the inhaler) as a most effectual means of treating diseases of the throat and lungs by the insufflation of medicated air.

The apparatus (Fig. 6), which consists of a pneumatic chamber and a compound medicating

Fig. 6.



COMPRESSED DRY-AIR INHALER.

*(Designed by the Author.)*

A, Medicating chamber; B, Pneumatic chamber; C, Face-piece.

chamber, is best used by placing it on a table or convenient stand, extending the air chamber to the fullest and taking a full and deep breath as the medicated air is blown into the throat, over the epiglottis



and into the open larynx during the act of inspiration. When the lungs are thoroughly filled and exhalation commences, *expiration should take place through the nose.*<sup>1</sup> The time required for exhalation will be sufficient for the bag to refill itself (the air being drawn through the medicating chambers) and be ready for use at the beginning of the next inspiration. *It is desirable that no effort be made to draw the air through the face-piece, the only exertion required being that of taking a deep inspiration when the air is forced from the Insufflator.*

By this means the air becomes fully charged with the antiseptic properties of the inhalant, and passes freely into the lungs. The preparation ordered with the instrument is to be dropped on the antiseptic gauze in the medicating chamber. Continue the insufflation for ten minutes, and repeat this treatment five or ten times, at stated intervals during the day, in the morning after dressing, about mid-day, an hour or two before dinner, and at bed-time.

For cleansing the larynx and vocal cords, and promoting strength and clearness of the voice, other modes of treatment come second to insufflation. It is so simple and rational that it cannot fail to commend itself to those interested in voice production, as well as for the treatment of bronchial and pulmonary affections. The lining membrane, the epithelium, is here more delicate than in any other part of the

<sup>1</sup> Thus retaining the medicated air in the respiratory tract as long as possible.



body. The cells which are so beautifully fine with their covering of ciliated processes (whose function it is to arrest and expel atoms of dust and foreign matters contained in the air, so that irritating particles shall not reach the lung-cells) cannot be brought under the immediate influence of medicines in any better way than through the air, neither liquids nor solids being allowed to enter the air-passages. Medicated fumes, steam, and cold water sprays are not so likely to come into contact with the pulmonary tissue as dry medicated air, to which there is no resistance offered.

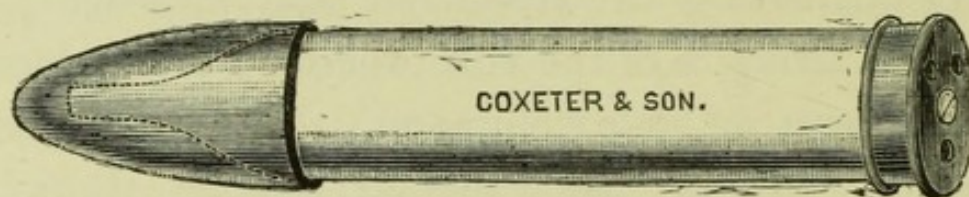
For increasing the resonance and improving the tone and strength of the voice there are several useful medicaments at our command. The free Oxygen which is given off when the air bubbles through a solution of Peroxide of Hydrogen<sup>1</sup> in the Insufflator, is invaluable for promoting strength and clearness of the voice. Combined with this, or used separately, I prescribe a mixture of Pinol, Terebene, and Eucalyptol, of which 20 to 30 minims should be dropped into the medicating chamber of the inhaler previously charged with Hydrogen Peroxide. By impregnating the air with the oxygenated products which are given off, and subsequently blowing it on the vocal organs, a surprising improvement takes place in the quality and tone of the voice.

<sup>1</sup>Hydrogen Peroxide (10 vols. strength). The "preserved" peroxide prepared by Kingzett is the most reliable on account of its stability.



To maintain the good effects produced by anti-septic dry inhalations in-doors, and render the treatment as constant as possible, I have devised a little instrument—a pocket inhaler—which is intended for use out-of-doors. One of its great advantages is that it can be carried fully charged with the inhalant, always ready for use by simply unscrewing the vulcanite cap which covers the mouthpiece. The quantity of medicated air inhaled can be regulated by an arrangement at the end which admits a quarter, half, or full draught as required. For most throat and chest

Fig. 7.



ANTISEPTIC POCKET INHALER.

*(Designed by the Author.)*

affections I strongly recommend this little inhaler charged with suitable inhalants according to the nature of the case and the advice of the physician in attendance, to be constantly used out-of-doors. It is not unsightly like some of the respirators in use, and can be inserted in the mouth and carried like a small cigar when walking, driving, at the city office, or when doing one's ordinary work. It possesses another great advantage, viz.:—that the absorbent medium being flannel it acts as a perfect filter against fogs or noxious gases, and purifies the air as it passes through.



## CHAPTER IV.

### RESPIRATORY GYMNASTICS.

Respiratory Gymnastics—Advantages with regard to Prevention and Cure of Consumption—Effects similar to High Altitude Resorts—Bad Effects of Stooping—Lung Exercise with Spirometer—Capacity of Lungs in Health and in Consumption—Curative Properties of Pure Air, Eucalyptus and Pine Forests—Hygienic Value of Peroxide of Hydrogen—Correct Explanation of the Action of the Coniferæ—The importance of Sunlight in the Treatment of Consumption.

To increase the respiratory capacity of the chest so as to produce a thorough ventilation of the lungs, and the displacement of as large a quantity of the residual air as possible—which during normal respiration remains unexpired—I have recourse to a system of *respiratory gymnastics*. These exercises I advise to be carried out frequently during the day, and, when possible, in a room or apartment, the air of which is dry and charged with the antiseptic properties of a volatile inhalant composed of Menthol, Oleum Pini Sylvestris; Oleum Eucalypti; Guaiacol and Terebene, with a small proportion of Chloroform to increase the volatilising power. The composition of the inhalant must depend on the state of the pul-



monary mucous membrane ; for instance, if there is a tendency to hæmoptysis, the TERPENES, which induce anæmia of the membrane, should be used ; whereas Creosote or Guaiacol, which induce a hyperæmic condition of the lungs, should be carefully avoided under these circumstances. When there is a fibroid condition of the lungs or an extensive deposition of tubercular matter (without a tendency to hæmoptysis, or a rise of temperature indicating a febrile state) respiratory gymnastics, combined with the inhalation of air charged with Guaiacol and Eucalyptus, will be found to yield immediate and most satisfactory results. The forced inspiration expands the lungs, and causes a freer ventilation of the affected parts, whilst the increased blood supply caused by the Guaiacol inhalation improves the vitality of the non-vascular tissue.

The effect of a system of respiratory gymnastics on the pulmonary tissue and membrane is precisely the same as what takes place when an individual ascends from the surface of the earth where the air is dense to a higher altitude where the air is rarefied. As one ascends the side of a mountain, the atmospheric pressure being much less than in the low-lying districts at sea level, the thoracic walls have more play, having less atmospheric resistance all around the body, and consequently greater expansion takes place. With the expansion of the chest walls, the lungs also expand, for it must be borne in mind that, though the lungs do not adhere to the inside of



the thoracic wall but are separated by the lining of the pleura, they follow the expansion and contraction which take place during inspiration and expiration. When the inspiration is forced, that is to say, when the arms are slowly raised from the sides and the tips of the fingers brought to meet as high as possible over the head, the thoracic wall expands in exactly the same way that it does when ascending to a high altitude. With this forced expansion of the thoracic wall, the lung also expands, and a greater extent of surface than usual is exposed to the action of the air inhaled, a larger quantity of oxygen is absorbed, and a greater amount of carbonic acid and watery exhalation got rid of.

Patients following out this treatment advocated for the prevention and cure of Phthisis, are obliged to practise—in inhalation chambers where the air is dry, ozonised and antiseptic—a series of lung exercises or respiratory gymnastics, which give results even more satisfactory than the breathing of rarefied air at high altitudes.

With increased expansion of the chest and lungs the bacilli and their excreta are exposed to the action of the dry germicidal air, and the volatile bacillicide inhaled to a much greater extent than during ordinary respiration. Consequently, whole colonies of them are destroyed when the tubercles break down; the toxine which they excrete is rendered harmless, and the spread of the disease prevented by the oxidising and antiseptic powers of the volatile bacillicide.



The gymnastics should never be pushed so as to cause weariness or exhaustion, nor practised too soon after hæmoptysis or blood-spitting, neither are they to be recommended when the temperature is high and the pulmonary tissue inflamed or irritable. Consequently they should be carried out only under professional advice. From the age of ten, chest exercises should be practised daily by those predisposed to Consumption as a most important means of strengthening the thorax and developing healthy lungs able to resist the bacilli when inhaled in an impure atmosphere.

The apex of the lung is where Consumption most frequently begins. There the air is less easily changed than in any other portion of the organ, consequently a stooping posture, such as leaning over a desk, when maintained for any time, is most injurious, for it induces contraction of this part of the thorax and prevents the free ventilation of the apices of the lungs. Exercises, taken in a stooping posture, such as rapid cycling, are not beneficial; whereas all exercises, whether the habitual use of dumb-bells, brisk walking, climbing, riding, slow cycling, should be taken with the shoulders thrown well back and perfect freedom allowed for the use of the arms and the full expansion of the chest walls.

Respiratory gymnastic exercise acts in a most beneficial manner.

1. *It develops the proportions of the chest and increases the capacity of the lungs.*



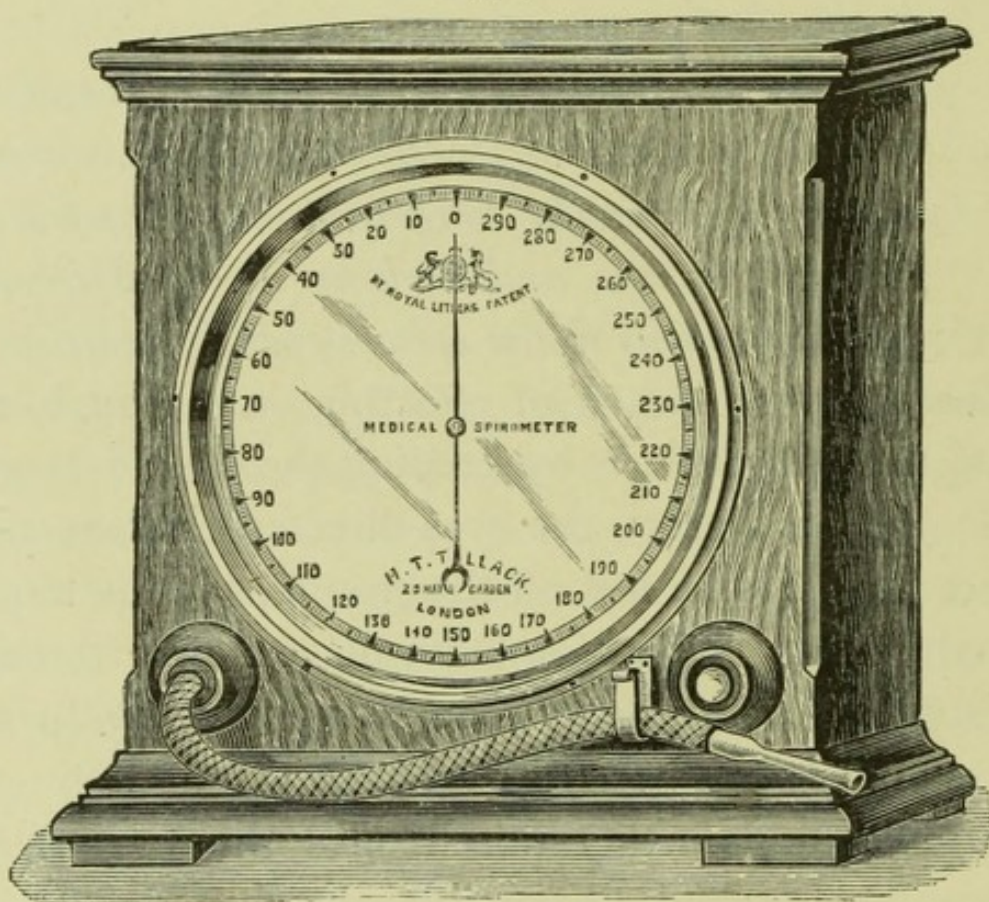
2. *It prevents contraction or deformity of the thorax.*
3. *It develops the intercostal muscles.*
4. *It increases the extent of lung surface exposed to the air.*
5. *It admits of considerably more air being inhaled, and consequently of more oxygen being supplied to the blood.*
6. *It displaces more than half as much again of the residual air ordinarily left in the lungs, and consequently clears the lung cavities of the poisonous exhalations and carbonic acid, which are most injurious to the system even in health.*

The simplest means of effecting a thorough expansion of the chest is by keeping the shoulders well back, the head erect, the eyes directed to some near object about fifteen feet off the ground, and the mouth closed so that respiration takes place slowly through the nostrils. The arms then hanging down by the sides should be slowly extended until they are horizontal, and further raised until the tips of the fingers meet as high as possible above the head. In this position they should be kept for a few seconds, the lungs being then thoroughly inflated. They are to be as slowly brought back to their horizontal position and again replaced by the side during expiration until as much air as possible is forced *out of the lungs*. Then there should be another rest for a few seconds until the beginning of the next inspiration, when the arms should be slowly extended as before.



The use of a good spirometer will be found most advantageous as a means of strengthening healthy lungs and increasing their respiratory capacity. In diseased conditions, when the chest walls are contracted and the capacity of the lungs reduced either by cicatrization, tubercular deposits, atrophy, or fibroid

Fig. 7.



STANLEY'S SPIROMETER, FOR MEASURING AND INCREASING THE RESPIRATORY CAPACITY OF THE LUNGS.

phthisis, a reliable spirometer should be used three or four times daily in conjunction with other respiratory gymnastics. By this means the lungs and chest walls will be exercised and a daily record can be kept of their increased power and respiratory capacity. Stanley's Spirometer (Fig. 7) is the best I know of.



When using the instrument, the greatest respiratory capacity of the lungs is measured by taking the deepest possible inspiration, and then slowly breathing into the Spirometer through the mouth-tube the most prolonged expiration possible. The quantity of air thus expelled from the lungs is indicated in cubic inches.

The playing of *wind* instruments and the daily practice of singing exercises, especially the system of diaphragmatic breathing taught by the late Francesco Lamperti, by which the art of pure vocalisation can be acquired ; that is to say, the practice of taking deep inspirations and controlling the breath (so that there is always a sufficiency of wind capable of sustaining the note to be sung), is productive of good results. Many a case of consumption has been unwittingly prevented or cured in the early stages by these exercises—especially when practised in the balmy air of Italy.

From the accompanying table it will be seen at a glance that the capacity of the lungs is considerably reduced in consumption, and in no case can patients be said to be thoroughly cured until the natural inhalations and exhalations approach the normal average of healthy lungs.

In healthy men the respiratory capacity varies chiefly with the stature, weight, and age.

The lung capacities of females are about one-third less than that of males. The first table gives the capacities when the lungs are fully filled and after-



*Table of the Vital Capacity of the Lungs, compared in Health and in Consumption, at 60° Fahrenheit, upon 5000 Cases (Male).*

HEIGHT.				HEALTH.		CONSUMPTION.		
Ft.	In.	Ft.	In.	Mean.	Minimum.	First Stage.	Second Stage.	Mixed.
5	0	to	5	174	146	117	82	99
5	1	—	5	182	153	122	86	102
5	2	—	5	190	160	127	89	108
5	3	—	5	198	166	133	93	113
5	4	—	5	206	173	138	97	117
5	5	—	5	214	180	143	100	122
5	6	—	5	222	187	149	104	127
5	7	—	5	230	193	154	108	131
5	8	—	5	238	200	159	112	136
5	9	—	5	246	207	165	116	140
5	10	—	5	254	213	170	119	145
5	11	—	6	262	220	176	123	149

wards entirely emptied, but as this requires some practice, the following table is given of the average of unpractised healthy human beings.

HEIGHT.							
		MALE.		FEMALE.		MALE.	
Ft.	In.	Cubic In.	Cubic In.	Ft.	In.	Cubic In.	Cubic In.
5	0	104	72	5	7	160	109
5	1	112	77	5	8	166	114
5	2	120	82	5	9	172	119
5	3	128	87	5	10	178	125
5	4	136	93	5	11	184	130
5	5	148	98	6	0	190	136
5	6	152	103				



When under 21 years old, according to AGE.					
	MALE.	FEMALE.		MALE.	FEMALE.
Years.	Cubic In.	Cubic In.	Years.	Cubic In.	Cubic In.
10	30	20	16	90	60
11	40	27	17	100	67
12	50	33	18	110	73
13	60	40	19	120	80
14	70	47	20	130	87
15	80	53			

#### ATMOSPHERE OF PINE FORESTS.

Whilst for centuries it has been known that the atmosphere of pine forests exhibits many curative properties, and is most beneficial to invalids suffering from laryngeal and pulmonary diseases, the precise action of the volatile emanations of the coniferæ has not until lately been clearly understood. It was broadly stated that the volatile oils of turpentine, eucalyptus, camphor, and other essential oils—mainly consisting of hydrocarbons (substances exclusively composed of carbon and hydrogen)—had a power of imparting ozone to the air by reason of the atmospheric oxidation of the terpenes contained in them, and to the volatile emanations collectively, the healing powers of the pine forests were ascribed.

Though the hygienic value of eucalyptus and pine forests is beyond dispute, and though their laboratory products exhibit similar properties, and are chemically allied, the explanation of their marvellous antiseptic



powers lies somewhat deeper than that of mere oxidation.

One of the most valuable oxidising products of Nature, and (next to water, to which it is closely allied) the most useful to man, is Peroxide of Hydrogen. While water ( $H_2O$ ) is composed of two parts of hydrogen and one of oxygen, Peroxide of Hydrogen ( $H_2O_2$ ) contains one atom more of oxygen in the molecule. It is to this agent, resembling ozone in its properties, that the antiseptic action of the eucalyptus, pine, camphor, and other trees is largely due.

This interesting fact was first conclusively proved by Mr. C. T. Kingzett, F.I.C., and in his valuable work, "Nature's Hygiene," he explains how he arrived at the conclusions which led to his discovery that "The essential oils absorb oxygen from the air, pure oxygen or ozone, and there is thus produced an additive product of an organic nature, exhibiting properties like those of ozone and peroxide of hydrogen ; in other words, an organic peroxide is produced." This he found took place whenever oil of turpentine, for example, is placed in contact with air. The oxidation of the oil (by means of a current of air) is "much facilitated" by the presence of water, and "there was thus obtained an aqueous solution containing so much peroxide of hydrogen as to be capable, when decomposed, of evolving twice its own volume of oxygen gas. It was thus proved that during the oxidation of oil of turpentine neither ozone nor peroxide of hydrogen is directly produced, but



that the active substance which is first formed yields peroxide of hydrogen as a secondary product when treated with water."

The peroxide of hydrogen thus produced is associated with several organic substances which are simultaneously formed, and in these facts, to my mind, is to be found the correct explanation of the action of the coniferæ, eucalyptus, and other trees and plants which exercise a salutary effect on the air—viz., they first absorb oxygen from the air (this absorption being, as Kingzett has shown, "much facilitated by the presence of water," which is always present in the form of hygroscopic moisture) and form peroxide of hydrogen (which is one of the most powerful oxidising agents of which we have knowledge) and the associated organic substances.

Kingzett followed up his discovery and reduced it to practice by the manufacture of Sanitās, a fluid rich in peroxide of hydrogen, and containing camphoraceous ingredients—notably soluble camphor and thymol—to which its antiseptic character is mainly due. When he passed a current of air through the volatile oils in the presence of water, he found an oxidized oil of turpentine containing a large quantity of camphoric peroxide (resembling in all its properties peroxide of hydrogen) floating on the surface of the receivers. This is known in commerce as Sanitas Oil, and is largely used as an antiseptic dressing for wounds, for fumigating sick-rooms, etc.

It is however, with its use as a specific means of



treating lung and throat diseases that the writer is particularly interested. By charging the air with the products which it readily yields up, by means of the pulmonary insufflator or dry inhaler, and furthermore by charging the patients' rooms with its properties, we undoubtedly produce what the discoverer, Mr. Kingzett, claims—viz., an artificial atmosphere containing all the active principles which are generated in pine and eucalyptus forests, and which are thus made available for the treatment of Phthisis, Bronchitis, Diphtheria, and other affections of the throat and lungs.

The importance of sunlight in the treatment of consumption can be imagined when we know for a fact that bacilli are readily destroyed, not only by direct sunlight, but even by transmitted light.

In her "Notes on Nursing," Miss Nightingale lays particular stress on the importance of light to the sick. The truth of these observations is great, and should be remembered by those attending to consumptive invalids. She says:—

"Second only to fresh air, however, I should be inclined to rank light in importance for the sick. Direct sunlight, not only daylight, is necessary for speedy recovery: except, perhaps, in certain ophthalmic and a small number of other cases. Instances could be given, almost endless, where in dark wards or in wards with a northern aspect, even when thoroughly warmed, or in wards with borrowed light, even when thoroughly ventilated, the sick could not by any means be made speedily to recover.

"Who has not observed the purifying effect of light, and especially of direct sunlight, upon the air of a room? Here is an observation within everybody's experience. Go into a room



where the shutters are always shut (in a sick-room or a bedroom there should never be shutters shut), and though the room be uninhabited, though the air has never been polluted by the breathing of human beings, you will observe a close, nasty smell of corrupt air—of air, *i.e.*, unpurified by the effect of the sun's rays. The mustiness of dark rooms and corners, indeed, is proverbial. The cheerfulness of a room, the usefulness of light in treating disease, is all-important.

“Heavy, thick, dark window or bed curtains should, however, scarcely ever be used for any kind of sick-room, in this country. A light white curtain at the head of the bed is, in general, all that is necessary, and a green blind to the window, to be drawn down only when necessary.

“‘Where there is sun there is thought.’ All physiology goes to confirm this. Where is the shady side of deep valleys, there is Cretinism. Where are cellars and the unsunned sides of narrow streets, there is the degeneracy and weakness of the human race—mind and body equally degenerating. Put the pale, withering plant and human being into the sun, and if not gone too far, each will recover health and spirit.

“It is a curious thing to observe how almost all patients lie with their faces turned towards the light, exactly as plants always make their way towards the light. A patient will even complain how it gives him pain lying on that side. Then, why do you lie on that side? He does not know, but we do. It is because it is the side towards the window. A fashionable physician has lately published in a Government report that he always turns his patients' faces from the light. Yes; but Nature is stronger than fashionable physicians, and depend upon it she turns the faces back, and towards such light as she can get. Walk through the wards of a hospital, remember the bedsides of private patients you have seen, and count how many sick you ever saw lying with their faces towards the wall.”



## CHAPTER V.

### CLOTHING AND FOOD.

Sanitary Clothing—Advantages of Pure Wool—Diet for Consumptive Invalids—The value of Goat's Milk—Goats are not Tuberculous—Malted Milk—Cod Liver Oil—Möller's Oil—The Best Method of Administration—Maltine and Cod Liver Oil—Fellows' Compound Syrup of Hypophosphites—Phosphated Food—Cocoa as an Article of Diet—Analyses of Five Preparations—Fresh Air and Exercise.

THE BEST CLOTHING for those predisposed to or suffering from consumption is pure wool. It protects the body against sudden changes of temperature, prevents chill, is light, inexpensive, and allows the free evaporation of exhalations from the skin. The texture should vary with the seasons, and an extra thickness should be worn over the chest, so as to act as a chest protector. All garments worn about the throat and chest should be loose so as not to impede the respiratory movements of the thorax. Tight-lacing and belts are most injurious, and should be strongly condemned.

The main points in connection with clothing are :—

- (1) To keep the skin uniformly dry and warm.
- (2) To wear next the skin a non-conductor of



heat, so that the natural warmth of the body shall be retained as much as possible.

- (3) The underclothing and interclothing should be made of light porous absorbent materials, so that all exhalations from the skin may pass freely away, and the perspiration exuding from the pores be thoroughly evaporated.

The materials, linen and cotton, made from vegetable fibre are ready conductors of heat, and, therefore, are not to be recommended as suitable articles of clothing in this cold and uncertain climate of ours, where it is necessary for the invalid to be constantly on his guard against the slightest chill.

Pure wool or hair is *Nature's clothing* for animals most exposed to the weather, and is a *non-conductor* of heat—that is to say, the body when thoroughly clothed in pure wool retains most of its natural heat at a temperature of 98° Fahrenheit. There is no more real warmth in wool itself than there is in cotton, the explanation of the one material feeling warmer than the other being that the *woollen substance prevents the radiation of heat from the body*, on account of its properties as a non-conductor: whereas linen and cotton materials are ready conductors of heat, and consequently do not so well protect the body.

Again, as an absorbent medium for the exhalations and perspiration, everyone knows how a cotton garment when saturated with perspiration will “cling”



to the skin and feel damp and cold ; whereas the light porous woollen garment absorbs the perspiration, which can then evaporate away, if the inter-clothing be also of porous woollen material throughout. Therefore, to keep the skin dry as well as warm, and avoid as much as possible the risk of a chill, the body should be clothed in light woollen undergarments, fitting well around the neck and reaching to the toes. To cover one part of the body well, and have another exposed, is indeed a grave error. It is a well-known fact that the entire body can be warmed or cooled by immersing the hands or feet in hot or cold water for a few minutes. For instance, in the summer time, when one has been playing tennis or sculling, and is desirous of cooling the body as quickly as possible, immersing both hands in cold water is often imprudently had recourse to. The explanation is that at each beat of the heart the warm blood coursing through the blood-vessels is brought directly into contact with the iced water, and cooled as it flows back through the veins.

In the treatment of Pulmonary Consumption, the physician has to be ever watchful and carefully attentive to important details. It is astonishing to find the almost culpable negligence, carelessness, or ignorance which often prevails. Too much attention is paid to purely medical treatment, and too little to such important points as sanitary surroundings, food and clothing. Perhaps never in my life was I more



astonished than on an occasion, a short time since, when attending a most serious case of phthisis—a patient well advanced in the second stage of the disease. Although unable to attend to his professional duties as a lawyer, he was not confined to bed, therefore I usually examined him in the snug little library in which he sat daily, using the Insufflator. During my first examination of the chest and lungs I was pleased to see that he wore a double-breasted Jaeger vest, and consequently thought it unnecessary to go into the matter of underclothing with him—knowing he had been under several leading men, and taking it for granted he had been well advised on the subject. One day he complained to me of a constant feeling of coldness of the feet and legs. When requested to show what sort of socks and drawers he had on, I found, to my horror, that this consumptive invalid—to whom expense was no object—had *never worn drawers*; had on a pair of thin merino socks, and wore boots of the thinnest material! His excuse was that he had never been in the habit of wearing drawers, had never been advised to do so, and thought, so long as the body and chest were well protected, it did not matter much about the legs and feet. I need scarcely say that I advised a complete suit of woollen underclothing, and explained that the body must be thoroughly protected—a frequent cause of Pulmonary Congestion being coldness and chill of the extremities.

The credit of having been the pioneer of the most



perfect system of clothing known to us at the present time undoubtedly falls to Dr. Gustav Jaeger. That eminent practical authority on the subject first pointed out the great hygienic value of a sanitary clothing which would preserve the body at an equable temperature (thus preventing chill) and at the same time permit the free escape of all exhalations from the skin. That woollen clothing can be adulterated by the introduction of cotton and "shoddy" is well known to experts. Shoddy is simply old used-up woollen material pulled to pieces and again worked up in the process of manufacturing second-class garments, which, when thus adulterated and sold to the unsuspecting public, are decidedly less conducive to health than pure woollen clothing.

From the foregoing remarks I need scarcely say that I am a thorough believer in the Jaeger Sanitary Clothing as one to be relied on in every respect for consumptive and other invalids. The recommendations as to *bedding*, in the popularly written work, "Health Culture," is of equal importance to patients suffering from pulmonary disease, as woollen clothing should be worn by night as well as by day.

The diet of patients suffering from pulmonary consumption requires careful consideration. It must be nourishing, not too rich in fats, as these often tend to upset the digestive organs. A free open-air life must be encouraged and suitable tonics administered, so as to promote a healthy appetite. The patient should never sleep on a feather bed, but rather on a comfort-



able woollen mattress, and, above all, the sleeping apartment must be well ventilated, free from draught, and charged with the volatile antiseptic inhalant. By light, nourishing food we must compensate for the waste going on in the lungs, build up the system, and increase the number and strength of the phagocytes in the blood.

For this purpose I have found from experience nothing can equal fresh goats' milk diluted with a small quantity of lime water. The effect of this easily obtained and excellent article of diet for consumptive patients has only to be tested to prove the astonishing results which accrue from its use, the flesh and blood of the goat being also used as articles of diet. It is worthy of note that *goats do not suffer from consumption*. Whether this is due to the lives these hardy little animals lead, being so much in the open-air, or to some inherent power, such as the presence of active phagocytes in the system, remains to be proved. Be that as it may, the milk of the goat is, without exception, the best food for consumptive invalids. It is light, easily digested, and contains strengthening properties of great value. Two or three quarts should be consumed in the day, and should be had fresh from the animal, when possible. Fish and oysters are also to be recommended.

Cows' milk cannot with any safety be recommended, as tuberculosis is communicated from diseased cows to man. In large towns and cities where people cannot rely on the milk supplied, this becomes a



serious matter, for, to keep feeding a consumptive patient on the milk of a tuberculous cow would simply be adding fuel to fire. It should never be taken unless it is thoroughly boiled beforehand.

A most excellent milk food, known as Malted Milk (Horlick's), is supplied in a dry state, and needs simply to be dissolved in water, at blood heat, to supply an excellent substitute for cows' milk for consumptive invalids. It combines the flesh and muscle-forming constituents of pure malt and wheat, in which all the starch has been converted into dextrine by the action of the diastase of the malt, in combination with fresh sterilized cow's milk, evaporated to dryness, at a low temperature, in vacuo. It is a well-known fact that the diastase of malt is so similar to the diastase of the saliva and pancreatic juice that chemists can show little, if any, difference between them. That being so, it readily digests the milk and the starch of the wheat. We have, therefore, a food that digests itself and furnishes the fattening element which cow's milk is deficient in. It is a fact of much importance that the process used in preparing the milk kills the bacilli, and consequently obviates all risk of infection. The germ of consumption (*Bacillus Tuberculosis*) is destroyed by a temperature of 150 degrees F. for ten minutes. The milk, before adding the diastase of malt, is kept in a sterilising boiler at a temperature sufficiently above the boiling-point, so that if, by any possible oversight, tubercular milk had been used,



the germs are thoroughly sterilised and destroyed ; thus all danger of adding to the bacilli already in the system is avoided by the use of this malted milk food.

Cod Liver Oil having for centuries been so constantly mentioned in connection with the "Cure" of Consumption, a few points connected with its history and chemistry cannot fail to be found interesting. At one time it was fondly imagined that the more revolting the oil was in taste and smell the better for the invalid. About the year 1852 Peter Möller introduced from "the land of the midnight sun" an oil which was then the best in the market, but even Möller's had an oily taste, and, what was less desirable, an inclination to "repeat," especially if taken in large doses or at improper times, causing a dislike and prejudice which are difficult to overcome.

The Norwegian, being a scientific chemist, for years devoted himself to the discovery and removal of these qualities, and Mr. Heyerdahl's researches in the firm's laboratory go to show that very little of what were hitherto considered the chief constituents of the oil—Oleic, Stearic, and Palmitic Acids—are to be found ; but, instead of these therapeutically valueless bodies, some hitherto entirely unknown yet remarkable compounds, two of which were determined and designated respectively Therapinic Acid and Jecorolic Acid. The former has the formula  $C_{17}H_{26}O_2$ , and belongs to an unsaturated group of



acids, but of a homologous series, which has had no representative before. In its structure it must have four double bonds (or two triple ones, which is less probable); is a very unstable compound, extremely oxidisable, and easily splits up. The oil contains about 20 per cent. of this acid. The second—Jecorolic acid, with which the oil is strongly impregnated—has the formula  $C_{19} H_{36} O_2$ , and belongs to the Oleic Acid series.

It is beyond doubt that to the presence of the Therapinic Acid the unique and invaluable remedial properties of Cod Liver Oil are due, and herein lies the secret of the frustration of all attempts to substitute any other compound or preparation. So great is the instability of this acid that the complete exclusion of oxygen during all re-actions and chemical processes was absolutely necessary to prepare it. This, then, suggested the necessity for a new process, so that all trace of atmospheric air and oxygen should be excluded throughout the entire preparation.

It is remarkable that the oil thus prepared is entirely free from the defects of the former oils; there is none of the oiliness or greasiness so much objected to, and our experience shows that its administration is followed by no "repeating" or eructations.

The administration of Cod Liver Oil in Phthisis is a point of vital importance in many cases. Since this remedy was introduced (about the year 1840) it



has passed through the usual phases witnessed in the history of medicaments. At times the most extravagant hopes were built on it, and when these were not fulfilled it was for a time neglected. This preparation undoubtedly possesses the power of imparting to the tissues and perhaps to the phagocytes strength to resist the inroads of the bacilli.

The question of the best method of administering the oil is one which often perplexes the physician. Even the very purest preparations, when administered to patients with an abnormally delicate digestion, sometimes disagree. Children bear the oil well when mixed with orange syrup; in fact, they often acquire a taste for it.

Niemeyer first suggested the combination of Malt Extract and Cod Liver Oil. The combination is undoubtedly an excellent one, and when well prepared and thoroughly mixed the globules of oil reach the stomach in such a fine state of subdivision that it is practically in a perfect condition for absorption immediately it comes in contact with the pancreatic ferments. The preparation *Maltine with Cod Liver Oil*<sup>1</sup> fulfils all the requirements suggested by Niemeyer, and so effectually disguises the taste and smell of the oil that the preparation is palatable and easily taken. The oil is so perfectly associated with the Maltine that it will keep for any length of time and never separate. We have in this excellent combination the fat of the Cod Liver Oil,

<sup>1</sup> Prepared by the Maltine Manufacturing Company.



with its traces of Iodine, Bromine, etc., intimately mixed with the bone and muscle-producing elements of wheat and oats, and the digestive properties of malted barley, most useful as a means of building up the system in the wasting peculiar to Pulmonary Consumption.

In the treatment of Consumption we are, from time to time, called upon to prescribe suitable tonic remedies. To build up the nervous system and stimulate the nerve-centres, as well as to supply to the thin-blooded anæmic patient some easily assimilated salt of iron, the preparation known as Fellows' Compound Syrup of Hypophosphites is strongly to be recommended. This compound is prepared from Quinine, Strychnine, Iron, Lime, Potash, and Manganese. There is, perhaps, no preparation in the list of suitable tonics for Consumptive invalids which has more deservedly come into general good repute than Fellows' Syrup.

The quinine is a valuable tonic, especially when combined with strychnine, which stimulates the nerve-centres; and the iron salt is constantly called for in the anæmia which usually accompanies Phthisis. The fact that these tonics are found in combination with phosphorus, in the form of hypophosphorous acid, renders this preparation still more valuable, not only in the early stages of Consumption, when the system needs strengthening and building up, but also in the later stages when the distressing night-sweats come on.



The presence of phosphates in the food is of great importance. The brown husky outer covering of the grain is discarded by the miller in the preparation of white flour, therefore bread does not contain the *phosphates* which are essential to the proper nourishment of the normally healthy (and much more so of the debilitated or diseased) frame. Brown or whole-meal bread contains the husky outer covering of the grain, but we know by experience that the vast majority of people do not, as a rule, continue the use of whole-meal bread for any length of time. The sensitive stomach rebels against it, and even when consumed the phosphates are so tenaciously held by the particles of bran, and are so locked up in the woody fibre that they are with difficulty extracted therefrom. A food containing these phosphates in a soluble, easily assimilated, *and digestible form* is called for.

I was, therefore, much interested to find in the *Lancet*, July, 1889, a report on a valuable phosphatic nutriment obtained from wheat bran. Under the title of "Frame Food" Extract, the soluble nutriment in the bran, freed from the cellulose or husk, is furnished in the form of a dry powder, which can be added to every kind of flour, to cocoa, etc. It shows a proportion of organic phosphates exceeding 10 per cent., and is prepared without the use of chemicals. "Frame Food" Diet, a cooked food (with this extract as the strengthening basis), can be highly recommended to consumptive persons as a



most valuable phosphatic nutriment, very palatable and digestible. It is quickly prepared with boiling milk or water.

A most excellent article of diet, naturally rich in vegetable oil, containing a large percentage of cellulose, and a stimulating active principle, *theobromine*, is Cocoa. It is rich in nitrogenous elements, and of such inestimable value as a builder-up and strengthener of the human frame, that we need be jealous of all devices used by manufacturers to reduce its value. The chief cause of the adulteration of cocoa is the superabundance of oil or butter which it contains. When taken in its pure form the bean consists of over 50 per cent. of fat—this fat being of a nature not easy of assimilation, or even palatable. To get rid of this some manufacturers do not scruple to add alkalies so as to convert the oil into what is literally a liquid soap, which deepens the colour, thickens the cocoa (which is held in suspension—not dissolved—when mixed with water) and gives it an appearance of strength which it does not possess. Other enterprising firms add starch and flour, and thereby not only reduce the proportion of oil, but also the nutritious and stimulating ingredients—the albumenoids and theobromine—contained in the pure cocoa. It is thus rendered almost worthless as an article of diet.

The following analyses show the proportions of the chief constituents of five preparations of cocoa :—



	Theobromine.	Albumenoids.	Fat.	Carbohydrates. Starch, Sugar, &c.	Cellulose.	Ashes, Phosphates, &c.	Water.
1. Pure Cocoa Nibs	1.5	14.2	51.	20.02	6.68	3.6	3
2. Cadbury's Essence ... }	1.92	17.7	29.03	39.43	7.56	4.36	„
3. Schweitzer's Cocoatina }	1.72	16.62	32.30	35.67	7.39	6.3	„
4. Van Houten's Cocoa ... }	1.53	16.66	31.62	33.20	8.86	8.13	„
5. Epps's Homœo- opathic Cocoa }	0.75	4.7	27.72	60.46	4.5	1.87	„

From the above analyses it is evident that Cadbury's Essence is so skilfully prepared that not only is the fat, the most objectionable feature from a dietetic point of view, so considerably reduced (being 21.97 less than that contained in an equal quantity of pure cocoa nibs), but, weight for weight, the *Theobromine, Albumenoids, Carbohydrates, and Cellulose are actually increased*, whilst the ashes (principally composed of potash and other alkalies) are not 1 per cent. in excess of pure cocoa nibs. This clearly shows that by whatever process Messrs. Cadbury remove the excess of fat from the bean, they do not add flour, starch, or other mixtures, so as to reduce the percentage of albumenoids and theobromine contained in their cocoa essence, and destroy its nutritive value as a diet.



Fine cocoa thus carefully prepared, and combined with sugar, besides being the most delicious and delicate of all confections, is certainly one of the most nutritious articles of food.

With a nourishing diet, the patient should practise as much exercise as possible, both in and out of doors ; dumb-bells, exercises with rubber springs, dry rubbing, and respiratory gymnastics indoors ; horse exercise, quick walking, sculling, cycling, running, lawn tennis, golf, and mountain climbing, out of doors, the one great precaution being never to get thoroughly tired. The patient should keep in the sunlight, and as free from damp as possible. To the consumptive invalid, the good old advice of "early to bed, and early to rise" is golden. Needless to say, each case, according to the nature of the disease, temperament of the patient, circumstances of life, family history, etc., will require special advice, exact rules of diet, and recommendations as to exercise, from the physician. For many cases I strongly recommend a mild electric current, either in the form of an electric bath, or applied direct to the chest walls two or three times a day.



## CHAPTER VI.

An Equable Temperature and Thorough Ventilation of Vital Importance—Consumption promoted by Impure Air—What Richardson says—A Remarkable Case—Why Soldiers died of Consumption—Mortality of Home Troops greater than of Army before Sebastopol—Unventilated Rooms the Vestibules to the Grave—Cure at Brompton Hospital without Special Treatment—A Case not benefited by Pure Air and Tonics—Good Results of Insufflation Treatment—My First Cure in 1884—Patient now in Perfect Health—A Case quickly cured in the Early Stage—Mistaken Diagnosis of Early Symptoms of Phthisis—Effectual Cure of Consumption in the Advanced Stage.

HAVING briefly hinted at the causation of Pulmonary Consumption, and accepted the bacillus theory, we must take advantage of the valuable discoveries made by those bacteriologists who have undoubtedly placed us on the right road to arrive at a correct, scientific, and satisfactory treatment. Following up the discoveries made, and bringing common sense to bear on the question, we arrive at conclusions which cannot fail to assist the practical physician, not only in curing individual cases, but in—what is of still greater importance—effectually checking the spread of the disease. Consumption, being due to the pre-



sence of the *Bacillus Tuberculosis*, is necessarily an infectious disease, for these little rod-shaped microbes often become detached from the sputa of patients, and get blown about in the air on small particles of dust, and are inhaled. The prevalence and virulence of this affection in some districts—such as Tahiti, the South and West of Ireland, parts of Brittany, and the low-lying and damp districts of Germany and Holland—can be easily accounted for by the dampness of the homes in which people live, the want of proper ventilation and sunlight in the cabins of the poor, and a peculiar moist warmth of the atmosphere incidental to the climate or due to the peat fires and thatched roofs. Plenty of fresh air, a dry soil, and as much sunlight as possible, with a generous diet, are essential points which must be insisted on, with a view to the prevention and successful cure of consumption. The destruction of sputa should be carefully attended to by those who wait on consumptive invalids, a small hand-spittoon containing some Sanitas fluid being kept specially for the expectoration. All pocket-handkerchiefs should be well boiled in the process of washing.

In the opening chapter of that valuable work, "Our Homes: and how to Make them Healthy," edited by Shirley Foster Murphy—Dr. Benjamin Ward Richardson gives a remarkable instance of the influence of impure air in the production of pulmonary disease. The facts speak for themselves, and conclusively show how all-important the condition of the atmo-



sphere indoors is to the patient, even when the greater portion of the day is spent in the open air. In a little work of this sort, specially written with the object of drawing attention to the *cause, prevention, and cure* of Pulmonary Consumption, and of pointing out the good results to be achieved by the constant inhalation of an atmosphere pure and charged with volatile antiseptic inhalants, the following quotation from so eminent an authority, which shows how injurious are the results of an impure atmosphere, is particularly valuable.

Dr. Richardson says :—

“One of the most fatal of our English diseases, Pulmonary Consumption, or consumption of the lungs, has been largely promoted by the presence of unchanged and impure air in the dwelling house. This fact has been so often observed, that it has led some to believe that Pulmonary Consumption is infectious under certain circumstances, and that living in a room where a consumptive person is also living may be serious in its consequences to those who are healthy. I have myself shown that consumptive persons who have lived in the same apartment have successively become affected by the disease, the following being, perhaps, the most striking of these facts :— A man, by business a hawker, a ‘cheap Jack,’ who was accustomed to live with some other members of his family in the van in which he travelled from fair to fair, and from which he sold his wares, was brought to me in the third stage of Pulmonary Consumption.



He soon succumbed to the disease, and was succeeded in business by his brother, who followed precisely the same line of life, and came to live in the same van. His brother soon afterwards became consumptive, and died. He, in turn, was succeeded by his sister's husband, who shared the same fate ; and, not to extend the narrative to an undue length, in the course of seven years I had before me no fewer than nine victims of the fatal pulmonary disease, in every one of whom it seemed to originate in that particular travelling-van. It was in vain I protested to those afflicted against continuing to live under conditions so favourable to disease. They argued that they were constantly in the open air by day, that they got regular change of air, that they were not exposed to wet, and that at night they were snug ; in short, they would not believe that sleeping in the van-house had anything whatever to do with the disease.

“ The observation of a series of facts such as these may at first sight seem to convey the notion that the poison of the disease was conveyed in the van, and was communicated from one series of its occupants to the next. The evidence is not conclusive. The first sufferer had bought the van new, and first occupied it ; he, therefore, did not get the disease by a process of continuation. The van was afterwards regularly emptied, cleaned, newly painted, and exposed to the air, so that the probabilities of the continuance of specific communicable poison in it are



most remote    The practical truth is, however, none the less valuable, that the disease originated so many times under the same conditions, and truths of this kind cannot be too often related.

“On a large scale the fact of the influence of impure air in the production of pulmonary disease was fully brought out in the Report of the Army Commission in 1858, respecting the life and health of our soldiers quartered in England. Before the appearance of the Report, and for some time afterwards—until, indeed, the recommendations of that Report were acted upon—the health of our home-quartered soldiers was so bad that their mortality was actually double what it ought to have been. The rate of mortality in the effective men of all ages of the army at home was 17·5 in the thousand. At the same time the rate of the mortality of the town and country population at the same ages was 9·2 in the thousand, while that in the country districts only was 7·7. In the population of one of the most unhealthy towns in the kingdom—namely, Manchester—the mortality was then very high; but even in this selected spot of unhealthiness it was only 12·4 per thousand of persons of the same ages, compared with the 17·5 of the soldiery.

“Here was, then, a most remarkable series of facts, in which contrasts of the most singular kind were established. Nor did the contrasts end as above stated. The soldier's life was a selected life, and ought, therefore, to have been better than that of the civilian of the same age. It was manifestly



worse, and so the reporters were led to a further analysis.

“ At last they came upon one cause which they could not exclude, which, in accordance with the Newtonian saying, was both true and sufficient cause to account for the phenomenon. That one cause, or rather that series of causes, was overcrowding, insufficient ventilation, and nuisances arising from latrines and defective sewerage in barracks. *A single agent, vitiated air*, acted with such intensity—especially when superadded to a certain degree of exposure—as not only to produce in the Foot Guards an amount of chest disease, and especially of Pulmonary Consumption, greater than was produced in civil life by all the other causes united, but actually to carry off annually a number of men nearly equalling in the infantry, and actually exceeding in the Guards, the number of civilians of the same age who died from all classes of disease.

“ One final observation crowned this research of the Commission of Inquiry. The Commissioners compared the mortality of the army when it was huddled before Sebastopol in 1856 with that of the troops at home, and discovered that the mortality before Sebastopol was nearly one-third less than the mortality of the infantry of the line, while it was two-fifths less than that of the Foot Guards barracked in England. The mortality of the army before Sebastopol during twenty-two weeks ending May 31st,



1856, was, including deaths by violence or accident, at the rate of 12·5 per thousand per annum, as against 17·9 in the infantry, and 20·4 in the Guards quartered in England.

“The record of these observations is the best and most forcible, because most extended and accurate, that has ever been supplied respecting the influence of confined air in the living and sleeping apartments of men who are accustomed even to an active life and to the enjoyment of much out-door life. If I or any other physiologist had desired to carry out a great experiment in order to inquire how diseases of the lungs might be artificially induced in men who had been healthy up to the time of experiment, we could not have devised any method that would have led to a series of results more striking and more convincing. Neither could we possibly have concluded our experiment more satisfactorily than was done in the recommendations of the Commissioners. They recommended ‘that an entirely new system should be introduced into barrack life ; that air, fresh and pure, should at all times circulate through the buildings, and especially through the dormitories ; and that every soldier should have efficient and sufficient breathing space.’ Since these regulations have been in force ‘the English soldier at home has no longer the unenviable position of being first in the ranks of those who fall victims to Pulmonary Consumption and other affections of the respiratory organs, but is rather the model of a lower mortality ; so that as the



gaols, once the foci of fever, are at this time the most free of that disease, the barracks, once the foci of consumption, are now the most free of that destroying malady.' Here we see a scale, as it were, of disease. In the gaol, in its very worst condition of foul air, the disease typhus was the scourge ; in the barrack, with foul air, but less foul, consumption was the scourge ; pure air being substituted in both places, both diseases have been enchanted away. Lessons such as these should never be cast aside, and they apply with the most telling force to our present work. In many of our best houses—I mean best in relation to their appearance and cost, not in respect of their construction—the errors which were common in the barrack are still present, and rooms are used as sleeping rooms which stand in the eyes of the sanitarian like so many experimental boxes for the synthetical development of pulmonary disease. The room is too small ; the room is devoid of a fireplace ; the room is devoid of a ventilator ; the room has a window that will open with difficulty, and at least but a little way ; and yet that room is used as a sleeping-room for one, or it may be two, persons. These are the rooms in which they who are disposed to pulmonary affection find their early fates ; these rooms are the vestibules to the grave."

Nowhere in medical literature do we find such overwhelming evidence ; and yet, either from ignorance or culpable negligence of simple hygienic rules, the



spread of consumption continues. The following example was recently brought to my notice :—

CASE :—*Chronic phthisis giving rise to infection.*

A Methodist clergyman residing at Plymouth, who had married no less than five times, in each case the bride being healthy and free from any taint of consumption, caused the spread of the disease amongst the women whom he married. He suffered from what we call chronic phthisis. His first wife soon contracted the disease, to which she succumbed in less than two years. The second, whom he married soon after, also became consumptive and died, and so on, until the lady who had the courage to become No. 5 found to her cost that she was likely to follow the others. At this stage, however, the reverend gentleman succumbed to the disease, leaving his fifth and last wife to follow him in less than six months.

Given a badly ventilated and small sleeping apartment, in which those healthy women slept with such a consumptive individual, inhaling the foul gases given off from his diseased lungs, and we find a perfect death-trap from which it would have been almost a miracle if one of them had escaped.

Comparatively bad cases improve marvellously in a short time without any special medical treatment when removed from a home where the surroundings are insanitary and the diet ungenerous, to one where the principles of hygiene are attended to and the



supply of food is good and nourishing. As, for instance, the following :—

CASE:—*A maidservant, æt. 18 years, from the East End of London : disease due to insanitary surroundings and insufficient food.*

Some time ago, when visiting the Brompton Hospital with one of the staff, I was forcibly struck by a case, which had put on nearly a stone in weight in a few weeks, and was making a rapid recovery. The explanation was not very difficult. The girl told me she was eighteen years of age ; had been a general servant in the "East End," up early in the morning and retiring to bed late at night ; food consisted principally of bread and tea with a little fish for dinner occasionally ; she slept in an attic, where she felt cold and miserable. Having been removed to a cheerful ward of the Brompton Hospital, given a warm and comfortable bed, abundance of good and nourishing food, and having her mind free from worry, she soon put on flesh, the hacking cough daily grew less, the dulness on percussion over the apices of the lungs vanished, the glassy stare left her eyes. In my mind I could not help picturing the work the phagocytes, strengthened by good food and healthy surroundings, were doing in her system, devouring the bacilli by thousands daily. This poor girl had been saved in the nick of time, before the lung tissue had broken down and before the latent vitality within her had become ex-



hausted. It was one of those cases occasionally met with, where Nature effects a cure without the aid of physic. This was a case of consumption where the insanitary surroundings and starvation rendered it impossible for the system to resist the inroads of the bacilli.

A different class of case and one that forcibly illustrates how little reliance can be placed on change of air and improved surroundings without some local treatment for the lungs, occurred in my private practice last year.

CASE :—*A London solicitor, æt. 35 : disease due to inherited constitutional weakness, and over-application to work in a badly-ventilated office.*

I was called in at the eleventh hour to see a young man (æt. 35), the junior partner in a well-known firm of London solicitors. Mr. — had consulted some of the best medical men in London, amongst others two consulting physicians, both of whom had pronounced the case beyond hope ; indeed, one of these gentlemen informed him that he could not live six weeks. He had wintered at St. Moritz, where he was attended by Dr. H. at the Kulm Hotel. Everything that could be done in the ordinary course of treatment was had recourse to ; a carefully well-regulated diet, tonics, hypophosphites, and a winter in the clear bracing air of St. Moritz failed to arrest the progress of the disease. In August, 1890, I was requested to attend him, and found both lungs



extensively diseased, the apices infiltrated with tubercles, together with a breaking-down of tissue and a cavity in the right about the size of an egg, situated between the third and fifth intercostal spaces. The expectoration simply swarmed with bacilli, and there was a rise of temperature.

There was in this case a loss of hope of recovery (a most unusual occurrence, as consumptive patients are generally hopeful to the end). Having explained the gravity of the case to his friends, and the remote probability there was of rescuing the patient, I determined to save him if possible. He was provided with a pulmonary insufflator and volatile germicidal inhalant, which was used in the insufflator through the day for hours at a time, and was frequently sprayed throughout the living and sleeping apartments.<sup>1</sup> He was put on a generous diet with Burgundy and stout. For the first few weeks there was no marked change. The patient, however, expressed himself more cheerfully, and remarked that he felt pleased to find that he was "doing something for himself." (If this insufflation treatment had no other recommendation than that it provided those unfortunate invalids with something to occupy their minds, it would, in itself, be a boon to them.) The first marked improvement I noticed was that the voice became stronger, the short hacking cough gave

I had not then devised the Exhaler, which gives off a constant blast of antiseptic air, and absorbs the atmospheric impurities. See page 38.



place to one which came on only at long intervals during the day, and, indeed, did not occur for several hours after the first attack in the morning.

The bacteriologist who was then engaged in examining the sputa of patients undergoing injections of Koch's lymph at the Throat Hospital, Golden Square, kindly examined several specimens of this patient's sputa, and declared that then, after three months' treatment, he could not detect any bacilli. At this time the severe winter of '90 had fairly set in, with its terrible London fogs and snow. My patient, who was feeling much better, determined to go a little his own way—thinking he then knew quite well what to do for himself—and decided to spend the winter in London, which he actually did, at his home in Notting Hill until March, when he foolishly went to Brighton. There the excessively cold March winds brought on an attack of congestion with a constant hacking cough, which eventually induced an attack of hæmoptysis, for which he was treated by a local practitioner. Contrasted with the foregoing case, this one forcibly illustrates how futile it is to place implicit reliance on change of air to a bracing health resort, improved diet and tonics, as this patient had at St. Moritz, without some local lung treatment.

In the one case we find a patient reduced by want and insanitary surroundings to such a state of constitutional weakness that her system could not resist the bacilli; but from the moment her surroundings were improved, and a plentiful supply of



good food administered, Nature asserted herself, and the bacilli were exterminated. In the other case, however, we have a patient without any constitution to work on, with insufficient vitality, and an absence of recuperative power; so much so, that though his surroundings were the most perfect, with a clear bright atmosphere at St. Moritz to live in, a generous nourishing diet, and the most able medical attendance, these were insufficient in themselves to cause the complete destruction of the bacilli, and some extra treatment was called for, which would help in destroying locally what the phagocytes were unable to do unaided.

CASE:—*Widow, æt. 28 years : disease due to prolonged drain on system, worry and exhaustion.*

In 1884, while attending a gentleman, Mr. S—, who then resided in the Priory Road, Clapham, I was informed that the lady who acted as his housekeeper had been suffering for some time from consumption, had given up all regular medical treatment, and was then trying some 'quack' preparation for which she paid the exorbitant price of 11s. a bottle. This villainous decoction she swallowed four or five times daily with the desperation of a dying woman clutching at a last chance—for what will consumptive patients not try?—anything for a last chance. The honest general practitioner shakes his head—he has given the empirical treatment recommended in the text-books a fair trial—if the wise consultant agrees



with the diagnosis, prognosis, and as an improved treatment suggests a long sea voyage, or a winter spent in Egypt or the South of France. We all know how sad it is to see the face of a poor invalid to whom such luxuries are impossible.

Mrs. P—— was then twenty-eight years of age, had five children alive, and had recently lost her husband. She was completely broken down in health through worry, exhaustion, &c., when her “chest became weak.” At the time I first examined her, she was barely able to attend to her ordinary duties.

On examination the chest walls were found to be extremely thin; the little frame had run down to the lowest. There was some slight blood-spitting: dulness on percussion and crepitation being marked over the apices of both lungs.

I told her employer, who had also been the friend of her husband, that she was in a very critical state, and that in all probability six months would be as long as she would last. He implored me to do my utmost for her. For a week or ten days I put her on the then recognized treatment, building the system up as best I could with Devonshire cream, fresh eggs, beef-tea, cocoa, and St. Raphael wine, besides administering hypophosphites with other tonics. After a month's treatment little or no progress was made, and the November fogs coming on my patient was obliged to keep to her bed till twelve or one o'clock in the day. Koch's discovery of the tubercle



bacillus was then much spoken of, and though inhalation treatment was not in good repute—due entirely, as explained in Chapter III., to the use of steam as a medium for conveying medicaments to the diseased lung cells—I determined to try the effect of *dry inhalations* on my patient. With this object in view, I used an inhalant composed of Ol. Eucalypti, Ol. Pini Sylvest., Creosote, Terebene, a little chloroform, and Spt. Vin. Rect. After some days she expressed herself grateful for a feeling of relief and “warmth” about the chest after using the inhalation. It then occurred to me that if the inhalations could be made constant and continued by night as well as by day the results would be bound to be proportionately greater. With this object in view I constructed a sort of awning of flannel stretched over a triangular frame, under which she slept very comfortably. The flannel was saturated with the inhalant. The expectoration at first increased, and the cough changed from a small hacking one, with which there was but little expectoration, to a freer cough with muco-purulent sputa.

After a month's treatment my patient grew brighter, the appetite increased, the chest notes became clearer, and the crepitation less distinct. There was still dulness on percussion over the apex of the right lung, and at times I could detect pectriloquy, as if a cavity had formed. In a few weeks more she was so much improved that I advised her to leave London, as it was then about Christmas time, and the fogs were particularly trying. She did so, taking



with her the inhalant, &c. In May following she returned to London, and, to my great joy, and I must say surprise, I found her almost perfectly cured. I examined her chest, and found that a cavity had formed in the top of the right lung, but that it was dry. I urged her to still continue with the inhalant, sprinkling it on the pillow and spraying the bedroom with it at night. She then passed out of my hands, and I saw nothing more of her for two years, during which she lived at Chertsey. There, in that rather damp locality, she spent two winters attending to her duties, and did not suffer from any chest or throat inconvenience. She now resides at Wandsworth, not a robust woman—she never was very strong—but in good health and entirely free from cough and general symptoms of consumption.

CASE :—*An unmarried girl, æt. 18 years. Pre-disposing cause, debility from residence in India.*

A soldier's daughter, æt. 18, home from India, came under my treatment about the same time. This girl was extremely debilitated, suffered from amenorrhœa, and was rapidly losing weight. The lung symptoms were not so far advanced as in the previous case. She was placed on what was practically the same antiseptic treatment. The St. Raphael Tannin Wine acted most beneficially, as indeed it does in all those cases of consumption associated with amenorrhœa. The natural tannin of the grape combined with the moderate amount of alcohol which



the wine contains in a form not irritating to the mucous membrane of the stomach agrees well, and acts as a blood-forming agent as well as a tonic and stimulating preparation to the debilitated system. This patient soon began to gain in weight, and in less than six months from the time she first came under my care was quite recovered. The notes in my case-book were, "Cough and expectoration, nil; appetite good, weight increased; development of chest considerably improved; menstruation normal."

CASE :—*An American girl, æt. 22 years. Incipient Phthisis mistaken for an affection of the nervous system.*

Miss E——, of Philadelphia, a handsome American girl, æt. 22, then travelling with her aunt, a New Jersey lady, came under my care at the Midland Grand Hotel, St. Pancras. At that time I was Surgeon to the hotel, and saw Miss E——, who was on the way to Paris to consult a physician to whom she had been recommended. She was extremely ill, and almost unfit to travel. On my recommendation they rested a short time in London, the incessant travelling and hurrying about from one place to another being most fatiguing and injurious to her. Whether she had developed any phthisical symptoms before she left New York or not I was unable to discover, but certain it was that, though she was on her way to consult a Parisian authority on nervous diseases, she was then in a condition that might have led to early and rapid lung disease. Having explained the



gravity of the case to Miss E——'s aunt, and assured her that the short cough, loss of weight, irregular menstruation, and other symptoms from which the patient suffered, were due entirely to lung trouble, she consented to stay at the Midland Hotel for some time under my treatment, and postpone the visit to the French physician. The weather at the time being beautifully fine, I encouraged daily drives to Hampstead and Highgate, where the patient was ordered to spend several hours every day walking and rusticating over the heath. The inhalant was used freely, being sprayed through the bedroom and private sitting-rooms by day and night; dry inhalations were used frequently during the mornings, afternoons, and evenings. This patient revelled in the fragrant odours of the pine and eucalyptus, and declared that the treatment was "most delightful." Be that as it may, however, she soon began to get well, and in six weeks, instead of going to Paris "for her nerves," she went to Richmond, where she stayed another month, and then returned to America. Before her departure she was profuse in her thanks and presented me with a souvenir "for saving her life." Last year a friend of mine from Philadelphia assured me that she was in excellent health.

CASE :—*A banker's clerk, æt. 27 years, in last stage of consumption. Cause, Catarrhal Pneumonia.*

In September, 1890, I was asked by Dr. Stacpoole, of Holland Park, W., to see, in consultation with him, a banker's clerk who was then extremely emaciated.



The doctor assured me that "everything had been done" for the patient. "If, however," he remarked, "your Insufflation Treatment will cure this man, I shall thoroughly believe in it, as he is in the last stage of Phthisis." The case is interesting from several points of view, and shows that even in the most desperate cases great hope can be held out to patients if they do as this man did. From the time the treatment was explained to him, and after using the instrument for a short time, he became buoyed up with hope, and declared that he could "now cure himself." After he had been a fortnight under treatment he had made such progress that I was fairly astonished. On inquiring how often he applied the treatment, his mother assured me that after his rum-and-milk at 7 a.m., he commenced the inhalations and kept on for nearly two hours, then about one hour after breakfast he commenced again. Sitting up in bed with a book resting on his knees and propped up with pillows, he would use his Insufflator for two or three hours at a time, and so on throughout the day in the afternoon and evening. His piquant remark, that it was the first time he had had a chance of doing anything for himself, was rather forcible. The following are some extracts from my note-book on this case:—"William E. T——, of Princes Road, Notting Hill, aged 27. Had Pneumonia in March, 1889. Treated in St. George's Hospital, and discharged after three months with cough and expectoration of greenish-yellow matter. Was subsequently seen by Dr. Symes Thompson, who took a special interest in the case. Twelve



months ago he was compelled to give up his post at the bank, his employers generously allowing him a year's salary. He then removed to Princes Road; the chief symptoms being cough, expectoration, and night-sweats."

In September, 1890, when I saw him with Dr. Stacpoole, there were large cavities in the apices of both lungs, with all the characteristic physical signs and symptoms of advanced Phthisis. There was great wasting of the body, the weight being reduced to 7st. 9lbs. The night-sweats were profuse and the expectoration was purulent and loaded with bacilli. He was then confined to bed all day. The patient was of a cheerful, energetic disposition, and readily grasped the fact that by constantly blowing the antiseptic dry air charged with the volatile bacillicide into the lungs he would help to destroy the bacilli and heal the cavities therein. In about four weeks from the commencement of the treatment I called one day to find Mr. T—— not only out of bed but out of doors. His mother said, in a very cheerful sort of way, that he went to have an early dinner with a friend, and would not return until five o'clock. On October 27th I made the following notes of the cure in my visiting-list:—"Night-sweats gone. Expectoration almost nil; cavities dry; weight increased nearly a stone." Having no employment in London, I then advised his mother to remove for the winter to Bournemouth, where the patient continued to improve, and proposed going into business. Since the issue of the first edition



of this little work I have heard that he is in excellent health, married and settled at Bournemouth. Yet this was one of the worst cases of Phthisis to be met with, and at one time seemed past all hope of recovery.

To give a record of all the cases now under treatment or cured of their disease, would be to unduly swell the size of this little work and to repeat over again the results recorded in the report which I have given of those few selected from my case-book. It is only when contrasted with the lamentable results of empirical treatment (when drugs are blindly administered day after day with no better result than to experience the disappointment of witnessing the unhappy consequences which invariably follow on a treatment which is both irrational and useless, not to say harmful in many cases) that the system of treatment, which I have briefly sketched in this brochure, is all the more to be recommended.

There is absolutely no element of danger in it, and besides being safe the antiseptic pine inhalations are decidedly pleasant. The respiratory gymnastics and other exercises so strongly recommended, develop the physique and wonderfully improve the bust, especially in girls; whilst in a comparatively short space of time a marked improvement takes place in the quality and tone of the voice. Patients who are willing to carry out this system of *antiseptic dry air treatment* may confidently look forward to good results.



## CHAPTER VII.

### HEALTH RESORTS AND OCEAN TRAVEL.

PATIENTS should not be over hasty in selecting a health resort for themselves, for this branch of therapeutics requires special and careful study. The medical attendant or the consulting physician must decide, and in doing so carefully consider—

- (a) The temperament of the patient.
- (b) The phase of the disease.
- (c) The presence or absence of hæmoptysis, or of rise of temperature.
- (d) Whether the case is one due to catarrhal pneumonia, without the presence of bacilli in the sputa.
- (e) Whether cavities have formed and bacilli are present ; or—
- (f) Whether it is a case of Acute Miliary Tuberculosis.

Having diagnosed the case to his own satisfaction, he decides whether the health resort shall be bracing or relaxing, whether it shall be at a high altitude, where the air is *rarefied, dry and cold*, as at St. Moritz ; *dry and warm*, as at Grahamstown, Aliwal



North or Durban, Natal; *or dry and charged with the volatile emanations of the pine forest*, as one finds in British Columbia on the slopes of the Rocky Mountains, where greater expansion of the chest walls spontaneously takes place, similar in result to that produced in the more dense atmosphere of the lowlands by respiratory gymnastics (see Chapter IV.); or, whether it shall be a health resort but little above the sea level, *dry and warm*, as Hyères or Cannes; or one of the home resorts—Bournemouth or Ventnor—on our southern coast. All of these have their advantages for different individuals and for different phases of the disease in the same individual. It requires a thorough knowledge of the subject, as well as practical experience of and acquaintance with the exact climatic conditions of the various resorts, and their effects on different constitutions, before a reliable opinion can be given to the consumptive invalid.

How often a consultant, whose word is law, orders a patient abroad and advises, for instance, "*the Cape*," without giving any precise instructions where to go to. It would be equally sensible to order an invalid *to Europe*, the variety of climates and the ranges of temperature in South Africa being certainly greater than are to be found over the south of Europe. For instance, the climates of Wynberg, Grahamstown, and Aliwal North differ as much as do those of Hyères, Mont-Dore, and St. Moritz. Nearer home the writer has observed the difference it makes when



ordering a patient to winter at Bournemouth or Hastings without giving precise instructions. Many invalids pine away in the "Bourne Valley," or in the vicinity of "White Rock," who would improve rapidly on the West Cliff, at the former, or on the highlands of Hastings or St. Leonards in the latter resort.

It is not within the scope of this little work to enter into the details of climatology. It may, however, be laid down as a rule that *patients—especially people of a nervous temperament—in the acute stage of Phthisis, with hæmoptysis, or rise of temperature, should never be sent to a high altitude health resort; whereas one of the most cruel, useless, and discreditable proceedings is that of sending patients far advanced in the disease on long sea-voyages, or to foreign health resorts to endure discomforts and die away from home.*

There are thousands of other cases of delicate individuals predisposed to consumption, or in the early stage of the disease, as well as invalids in a convalescent condition, to whom pure ozonised air with abundance of sunshine will be invaluable adjuncts to the special treatment advocated in this little work. A sea-trip in one of the magnificent steamers of Sir Donald Currie's Line to the Cape; the Royal Mail to the West Indies and Brazil; the Orient or Peninsular and Oriental Steam Navigation Company's ships to Australia; or the New Zealand Shipping Company's boats, will suffice to render many fit to return to England and face our changeable climate once again.



Life on board a large ocean-going steamer has some peculiar phases, and with such drawbacks as must be expected at sea has many advantages. A great number of passengers never suffer from sea-sickness.

Those who are predisposed to "*mal de mer*" can easily ward off or greatly modify an attack by attention to a few simple rules, such as taking an aperient the night before embarking, partaking of light food only—biscuits and dry champagne—whilst the feeling lasts, and about twenty grains of Bromide of Ammonium every four hours.

It does not follow that, because invalids suffer greatly from sea-sickness on board one of the Channel steamers, they will necessarily suffer to a proportionate extent on one of the large ocean-going boats; quite the opposite is often the case. Many years ago the writer made a trip from England to Brazil, returning from Santos to Southampton in one of the West Indian Mail ships, without a feeling of sea-sickness. Having spent a few days in England, a passage by one of the Northwall boats to Dublin produced the train of symptoms which might be described as an acute attack of "*mal de mer*." The peculiar motion of the smaller boats and closeness of the confined cabins mainly account for the difference in feeling on board. These remarks on the advantages of ocean steamers are the outcome of practical experience, and are intended to dispel many vague ideas and groundless fears which have frequently



been found to exist with regard to travelling for health or pleasure to one of our colonies.

The following graphic description from the pen of Mr. A. Wilmot, F.R.G.S., will give some idea of the life and surroundings on board a first-class ocean-going boat.

“A large steamer is really a floating town, and to observe this it is only necessary to take a walk along the various passages, or streets, which lead along the sides of the ship. We have already visited the cabins of the ‘upper ten’—our ‘West End,’ that is, with its numerous first-class residences. Let us now go in the opposite direction. Passing the bar and bath-rooms, in which the indispensable luxury of sea-water baths is always at the disposal of the passengers, we come to the second-cabin accommodation—our Camden Town. Excellent cabins surround a saloon where everything speaks of cleanliness and comfort. If luxury be conspicuous in the first class, comfort is the prevailing feature in the second. Let us still go onward and examine the third-class or emigrant portion—our ‘*quartier ouvrier*.’ Everything is clean—the sleeping-berths are enclosed in well-ventilated apartments, and no exception whatever can be taken either to the rations or to the accommodation. Thence to the forecastle—the seamen’s quarters—and then to the bridge and hurricane deck, where in some ships the captain has his cabin—‘aloft in awful state.’ After all, the deck, on a voyage over summer seas from England to South Africa, is the passenger’s



real home. Spacious awnings form a capital roof. Lounges, chairs, and benches form seats. What a wonderful and blessed rest can here be enjoyed by the jaded business-man, or the worn-out invalid, with nothing to do but to breathe the life-inspiring ozone from the far-stretching ocean, and be fanned by summer breezes coming from summer seas! It is rest without laziness, variety and change without fatigue. Tourists and invalids would go by hundreds to South Africa if they could only be made aware of half the advantages to be enjoyed on the voyage."

Nearly all the great ocean-going lines are now keenly alive to the importance of providing every possible comfort and convenience for the benefit of invalids travelling for health and pleasure. The change from the old sailing-ship days is great. Every luxury to be found in a first-class hotel is provided for the comfort and well-being of those on board; the hygienic and sanitary arrangements of the ships leave nothing to be desired. The state-rooms are a model of comfort and convenience, being provided with electric light, electric bells, &c., and the bath-rooms, especially those on the mail boats, have a constant supply of hot and cold water laid on, consequently sitz-baths, warm and cold sprays, and shower baths can be had at will.

The classes of consumptive invalids to whom a sea-voyage is likely to be of benefit are those in the early stage of the disease and those who have successfully undergone special treatment and are in a convalescent



condition. Then they derive immediate and lasting benefit from the voyage and from a residence for a time or permanently in one or other of the many health resorts of our colonies where the air is clear and dry, with an abundance of sunshine. To bundle patients off wholesale without having regard to the phase of the disease, and without accurate knowledge of the climatic and other conditions of the country to which they are bound, brings discredit alike on the physician and on the health resort.

When cases are carefully selected and particular routes chosen for them, where they reap to the fullest the advantages of pure air, bright sunshine, and cheerful surroundings, combined with the antiseptic inhalation treatment and special diet, it is marvellous what rapid strides consumptive patients make toward convalescence and complete recovery. They literally seem to shake off the network of disease which the bacilli have woven through the lungs, and return to their homes and friends full of new life and vigour. The influence of the mind is so great that patients derive much more benefit from special treatment, pure air, and sunshine when the surroundings are pleasant and agreeable, and there is a change of scene and some healthy fresh excitement to be looked forward to on the morrow, than when they lead a listless life and go through a dull, monotonous routine day after day.

At most of the lauded continental resorts, and nearly all the English, you will find such patients



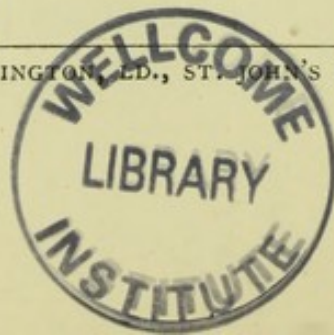
reap the smallest possible amount of benefit from the pure air and health-giving sunshine. They go dressed as for a promenade in the Row, tightly laced, and almost afraid to make an exertion; they receive the regulation daily visits from the medical attendant, swallow the regulation quantity of physic, talk all day long about their ailments, sleep away the afternoons (on stomachs full and overworked, and consequently do not enjoy a refreshing night's repose), and spend the evenings in drawing-rooms imperfectly ventilated and overcrowded.

Having been an observer of this state of things for years, I strongly advise patients to go where their surroundings are likely to be pleasant and agreeable, free from nonsensical and unnecessary restraint, in fact, not to select a slow and stupid health resort. In the special sanitarium which the writer hopes to see established before next winter in the South of Hampshire, every possible outdoor amusement and recreation will be provided for the visitors—golf, tennis, cycling, excursions on foot and carriage drives being more beneficial to consumptive patients clad in loose woollen garments and dieted on suitable light but nourishing food, than the surroundings to be met with in overcrowded health resorts.

FINIS.



GILBERT AND RIVINGTON, LTD., ST. JOHN'S HOUSE, CLERKENWELL, E.C.





PRESS OPINIONS

ON THE

PULMONARY INSUFFLATOR.

*The "British Medical Journal" says :—*

"The striking difference between it and the ordinary inhaler is that the work of drawing the air through the medicating chamber is done by the Insufflator, thereby saving the patient the fatiguing effort which often deters invalids from using an inhaler. It is most useful in acute asthma, pulmonary consumption, laryngitis, bronchitis, croup, and diphtheria, as well as in cases of eustachian deafness, and post-nasal catarrh, as a ready and convenient means of introducing medicated air into the respiratory passages without any extraordinary effort on the part of the patient. Excellent results have been obtained in treating cases of aphonia, loss of tone of the vocal cords, and generally for increasing the resonance of the voice in singers and public speakers, by insufflating the oxygenated air which is given off when the Insufflator is charged with peroxide of hydrogen, to which a little spirit of ammonia, eucalyptia, and terebene are added. It seems well adapted to serve the purpose for which it is intended."

*The "Medical Press and Circular" says :—*

"An ingenious apparatus which is likely to come into general use for the treatment of laryngeal and pulmonary affections. It is especially in the treatment of consumption and chronic lung affections that the Insufflator will be found most useful as a convenient means of introducing such preparations as the oil of pine and eucalyptus, guaiacol, etc., into the respiratory organs."



NOTATION



