

"PERSONAL EXPERIENCE OF PHTHISIS PULMONALIS"

"and what it taught me."

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During the past twenty years no disease has received more attention, and exhaustive investigation both at the hands of the clinical observer, and the bacteriologist than tuberculosis.

Books of more or less ability on this subject have been pouring from the press, and medical journals all over the world have been replete with its discussion, and yet we are far from the last word. In this great research the specialist, and more particularly the bacteriologist with his laboratory and microscope, and his freedom from the harassing calls of the busy general practitioner, must take the preeminent place; and yet there is a position, though subordinate, for the physician who has ever kept prominently before him that no true success can be attained in his profession but as he applies physiological and other principles to the healing of disease. Unfortunately there are medical men who have a further qualification for the close, intelligent, and sympathetic observation of this disease in its manifold varieties, and that is that they themselves are the victims of this fell scourge. Who that has seen the wretched remnants of humanity eking out their existence in the last stages of consumption, but has shrunk from the bare possibility of contracting the loathsome thing? Who can conceive the darkness of the hour, when the medical man, with all his scientific knowledge of the horrible possibilities of this disease, has to

face the crushing fact that he himself is in the grasp of the tubercle bacillus? We discover some physical signs of mischief in the lung of a patient, and on microscopic examination we verify our suspicions that these signs augur incipient Phthisis, and quite conscientiously, we speak hopefully and assuringly to the patient, and in his happy ignorance of the pathology of the disease, and in his confidence in the ability and honesty of his medical advisor he goes away full of hope - By virtue of his very knowledge this helpful consolation is denied the medical victim. It is because of this unwelcome qualification of personal experience that I trust my own case may add something to our better knowledge of this malady, and more especially to a better grasp of the enlightened principles that should guide us in its treatment. In order to this I must give my history as fully but as concisely as possible - and so that I may accomplish this abbreviation I may somewhat depart from the orthodox order of clinical reporting.

There is absolutely no family history of tuberculosis in any form, as far back as I can go. I was born in 1862 - an one of a family of eleven - have always been delicate owing chiefly to a wretched digestive apparatus - have suffered from the whole round of "*Childhood's* ~~childhood~~ diseases" - had measles rather badly at the late age of eighteen years. I entered a Bank office when

fourteen and a half, and, though confined to my desk all day long kept up my study of Latin and Greek both morning and evening, so that I had practically no time for open air or recreation of any kind. Having quit^ted the Bank at the end of a year I entered upon my University course after some time spent in preliminary study, and in the end of my second year had a complete breakdown due to dyspeptic trouble which resulted in severe nervous prostration necessitating my surrender of all study for two sessions. At the end of this time, still far from well, I returned to Glasgow to seek advice as to the advisability of my resuming work, and, though strongly urged to abandon medical study, I was allowed to proceed on the understanding that I was to do a minimum of work, merely what constituted an annus medicus, and that I was on no account to dream of competitive examinations. During all this time I had no cough whatever, though I know now, that my medical advisor had grave apprehension of pulmonary trouble, from his insistence on my consuming large quantities of cod liver oil. In 1886 I graduated - my weight then being barely nine stones - my height five feet six and a half inches. In this same year I went to Australia, as surgeon of a sailing ship, in the hope that the long sea voyage and the enforced rest would conduce to a restoration of physical vigour, that would enable me to face the battle of life.

After travelling for some months as Life Assurance Medical Referee I commenced City practice in January 1888 in Melbourne, and for eight months all went well. At the end of this time I contracted phlegmonous erysipelas of the head and neck, and this left me with a mitral systolic bruit, and oedema of the lower extremities which necessitated absolute rest for nearly half a year. At the end of this time I resumed practice and all went well for a period of eight years. Having met with considerable success in my profession, my practice entailed great mental and physical strain, and in consequence, my old enemy, atonic dyspepsia, manifested itself again. In the beginning of 1897 a severe Influenzal epidemic spread over Melbourne, and for the first time I fell a victim to it, and during the next eighteen months, at varying intervals, I had three attacks of so called Influenza.

After my fourth attack I was much reduced in condition, being now down to eight stones seven pounds, and in spite of a month's rest in the hills I had a slight, but persistent cough, with very little expectoration. The character of the sputum was chiefly clear, and very small in quantity like little lumps of boiled sago, and occasionally very slightly purulent in the mornings. At no time was there any sign of blood, but microscopic examination demonstrated the presence of tubercle bacilli in limited numbers.

I wish to draw special attention to the fact that I had no direct pulmonary symptoms till after my fourth attack of Influenza, but for fully twelve months before my final breakdown in November 1898, I had a dull pain over the left pectoral area - a dragging feeling, as if the pectoralis major had been in a chronic state of fatigue. At first I attached no importance whatever to this symptom - that is as far as its pointing to any pulmonary significance was concerned - and I explained it to my own satisfaction by concluding it was muscular, and due to the fact that I invariably expressed the placenta with my left hand in midwifery practice.

In the light of after events I am now convinced that this was a very important sign of nervous origin, fore-running, and serving as a warning beacon against serious danger, not only impending, but already establishing itself in the system. I shall presently discuss this symptom and its paramount and urgent importance in many cases of incipient Phthisis ~~and~~ Pulmonalis.

For eighteen months I underwent the open-air-rest treatment in my own bungalow situated at an elevation of eight hundred feet above sea level, on an iron-stone range of hills covered with the eucalyptus forest about twenty eight miles inland from the City of Melbourne. I gained two and a half stones in weight, and could eat well-nigh anything, but, as my symptoms had not entirely

disappeared, I deemed it wise to go to sea for a time, and so entered the mail service between Sydney and London for thirteen months. At the end of this time, as I considered my health re-established, I elected to buy a practice in Fremantle Western Australia, as the climate is much more equable than that of Victoria. In this place I worked hard for two and a half years as a general practitioner but as my weight was steadily decreasing, and some of my old ominous symptoms, such as cough and expectoration, were again asserting themselves I had to bow to the inevitable and resign my work at the beginning of this year.

I have thus far epitomised my life history, as it is only in its light that I can scientifically discuss Phthisis Pulmonalis and the principles that ought to guide us in its management.

Firstly I wish to enquire exhaustively into our open-air methods. As the even-temperature idea by means of heated air has now been practically abandoned I shall devote no consideration whatever to it, and merely mention it in order accurately to define my position.

By open-air methods I mean the treatment as now carried out in well-nigh all Sanatoria where the windows are kept as widely open as possible day and night, so that the patient lives continuously in a pure and ever-changing air. In the very beginning of my thesis I must protest against the unqualified manner

in which this treatment has been "boomed". I am satisfied, that the victims of tubercular disease in general, and especially of phthisis pulmonalis, will never recover apart from spending their lives uninterruptedly in the open air. But while conceding this, and emphasising it with all my might, I still maintain that the good results of the treatment have been, not intentionally perhaps, but all the same grossly exaggerated, and that the hopes of the patient have been unduly raised, only to be cruelly dashed down, when the inevitable dawns upon him. I have frequently read Articles in our medical journals, British as well as Colonial that would lead one to suppose that a six months' residence in a Sanatorium would absolutely cure not only incipient, but considerably advanced cases of consumption, and enable the patients once more to undertake the responsibilities of life in health and vigour. Such exaggerations can only be indulged in by the inexperienced; and it is high time that such terms as "cured" and "relatively cured" should be scientifically defined, for they may mean much or little, according to the character, ability, and scientific acumen of the observer. I am convinced that this attitude largely arises through failing to apprehend clearly the part that fresh air plays in the arrest of this disease. Open air is loosely spoken of as the cure of consumption, and men fail to notice that it is so only indirectly, and that

the intermediate effect, in the shape of improved powers of digestion and assimilation, is the real cause of the cure. It is affirmed in support of this erroneous notion that open air and sunlight are inimical to the life of the bacillus, and that a comparatively short exposure is sufficient to destroy the germ outside the body. But this is not a case of true analogy, for it is impossible to get the sun-rays directly to the bacillus in phthisis pulmonalis, and further, we find as a matter of fact that the bacilli abound most in those situations of the lungs where the access of air is most free. Is it not in the walls of cavities freely exposed to the air that we find the bacilli in greatest abundance? Sometimes in such masses that when stained they can be seen even without the aid of the microscope? It may be objected to this, that when such a state of matters is possible, it is only when the disease is in such an advanced stage that the tissues are no longer in a condition to successfully resist the inroads of the micro-organisms, and that it is on this account that we find the bacilli in such masses; but if this were really a valid objection the bacilli would be equally numerous in other parts of the lung tissue. It might be further objected that the access of air to a cavity is not so free as it seems, as we often find the orifices of the communicating bronchi projecting like papillae on the surface of the cavity, and the

chronic fibroid induration frequently leads to complete occlusion of the air tubes: but this is decidedly questionable as the mouths of the tubes can always be defined by a small probe, even in the most perfect cases of so-called occlusion.

Apart from this the clinical facts overwhelmingly support my contention, that open air and sunlight, all-important though they be, are only stepping-stones to the great end, which the intelligent physician should constantly aim at, and that is the re-establishment of the powers of the stomach, and the perfect functional working of the alimentary tract as a whole. If we accomplish this we place the patient in a condition to successfully combat the destructive tendency of the tubercle bacilli, and it might almost be laid down as an axiom, that if the digestion be sound, the hope of recovery is sound also - and I maintain that the prognosis in phthisis may be confidently based on the state of the digestive system. This statement requires a certain amount of qualification, for we sometimes come across acute cases of phthisis in which the powers of digestion and assimilation seem little impaired during their whole course.

From my own experience personally, and also from my observations of others, I am confirmed in the belief that this ideal state of the alimentary canal can never be secured unless we relegate open air and sunlight to their true places, as merely

steps to the great goal in view. Every new text book lays increasing stress on the importance of fresh air and sunlight, and rightly so too, if this emphasis be qualified by stating unequivocally the part that they play in the treatment; and this qualification must extend to an exact statement of the kind of open air wanted.

The sunniest climate is not the best. In places where it is nine months hot, and three months hotter, as in some parts of Australia, phthisical patients go rapidly down hill, for the excessive heat is so relaxing that appetite is interfered with, and insufficient food being taken, the vigour quickly declines, the natural resistance of the body is decreased, and thus the bacilli are placed in a position of advantage for their destructive work. A bracing climate in the uplands, where the air is crisp and keen, even if the rainfall be considerable, is, par excellence, the environment for the phthisical. There is no place on earth, where the sun shines more brightly, than on the coast lands of Western Australia. (I am not now speaking of the tropics). For seven or eight months in the year the sky is unclouded, as the most ideal Italian, and this in a sub-tropical latitude, and yet I have never seen phthisical cases do worse than here, if they remain all the year round. In the winter months when the weather is mildly cold, and when the rain comes down in

tropical torrents, the subjects of consumption do infinitely better than in the dry summer months. Indeed they invariably lose ground in the summer, while early cases make steady progress in the winter despite the excessively heavy rainfall of about thirty inches within the three months, of June, July, and August. The coastal regions of West Australia, below the tropic of Capricorn, get practically all their rain within the narrow limits of four months. I persistently emphasise this phase of the question, in order to combat the too common idea that abundant sunshine is the sine qua non in the treatment of pulmonary tuberculosis. The importance of sunshine cannot be over-estimated provided we sufficiently qualify our assertion, that it be obtained under otherwise favourable conditions, and pre-eminently in a cool and bracing latitude whether this be in the uplands or on the sea level. If we are under necessity to make a choice in any case, my own experience would lead me to say rather less than more sunshine.

This seems to be the opportune place, for protesting against the habit of many British practitioners of loosely recommending Australia as a favourable sphere for the phthisical, without knowing the conditions prevailing in our island continent.

Often have I examined patients, on the eve of their arriving there

and I would not on any consideration accept the responsibility of the man, who advised them to cross the sea to a sunnier clime: and I cannot help feeling that this blunder is most frequently committed, owing to the fact, that so many hold the vague notion, that sunlight is a kind of panacea for this disease.

How is it to-day that in our sunny Australian Colonies tubercular disease is the greatest single cause of death, and that three fourths of the deaths ascribed to tuberculosis are due to phthisis pulmonalis? How is it that the mortality from this disease is proportionately as great in the sun-bathed cities of Melbourne and Sydney as murky Glasgow? If it be answered that this is due to the people being massed in these cities in insanitary surroundings, I answer that the density of the population is not so great as at home, and that the sanitation of both the cities named is far in advance of Glasgow.

But over and beyond this none of our butcher-meat is obtained from stall-fed cattle. Our bullocks roam o'er boundless plains which are bathed in well-nigh cloudless sunshine all the year round, and yet the mortality among our cattle from this disease, though not nearly so bad as in England is still very high. In the year 1897, in the principle abbatoirs of New South Wales 3673 animals were condemned by the authorities as unfit for human consumption, and of these 2571 were for tuberculosis.

In the following year 5902 were condemned, and of these 5006 were tuberculous .

How is it again if sunshine be so important that London with its fogs, and cold, and dense population, has well-nigh the lowest mortality from phthisis ^{of} ~~from~~ any city in the world? At the risk of reiteration, and in case of being misunderstood, I would again emphasise the fact, that our supreme aim by open air methods is the attainment of as perfect as possible a condition of the organs of digestion, and that this desirable end is arrived at not in the sunniest climes, but where the air is crisp, and the sunshine not excessive.

No one acquainted with the physiological fact that amoeboid movement is arrested by a CO_2 , and resumed again on the administration of pure air, will undervalue the beneficial effect on cell metabolism, of continuously living in an atmosphere as chemically pure as possible. It is in this connection that breathing-exercises are of such vital moment in some cases of phthisis pulmonalis. Although it is well known that fresh air has an antiseptic action on the tubercle bacillus, even in the dark, it is perhaps not so much on this account, but because of its effect in promoting healthy tissue change, that special respiratory exercises are of importance. I knew that this practice has been much condemned, and it is certainly injurious under some

circumstances, but if we are careful in making a proper selection of suitable cases, I am convinced that we possess in this a powerful instrument for good. In my own pre-tubercular days my chest measurement was barely thirty two inches; now it is thirty six, and on full inspiration thirty eight inches; and I cannot regard this but as of vast consequence, as a factor in the retardation of the progress, if not in the complete arrest of the mischief. This practice of voluntary deep breathing, undoubtedly leads by degrees to a permanent increase in the capacity of the chest. The air taken into the upper passages in ordinary breathing, only in part, reaches the alveoli directly by the inspiratory effort, the rest finding its way down according to the law of the diffusion of gasses; how important then, that the breathing or tidal air should be supplemented by the complementary air, so the the reserve quantity or residual air should be changed as frequently as possible. Thus the residual air, instead of remaining a comparatively stagnant pool, is kept in a constant state of change, and therefore fresh, and potent in its antagonism to the bacillus.

The parts of the chest which are least moved by ordinary breathing, are just the parts where in the large majority of cases tubercular mischief begins, and if, instead of inspiring twenty five cubic inches, we inspire a hundred, these regions

have four times the chance of movement, and consequently of adequate aeration, that they have in ordinary breathing. When we remember that the bacilli, immediately they are liberated from the lung tissue, have a tendency to gravitate to the lower strata of air within the lung, it becomes a further argument in favour of changing the residual air as much as possible. This, I contend, can be most advantageously accomplished by well regulated deep-breathing exercises.

On the authority of the physiologist, we know that the law of diffusion alone, is not sufficient to account for the quantity of gasses in the blood; so that it is extremely probable, as some physiologists teach, that the alveolar epithelium plays an important part, not only in the absorption of oxygen, but also in the elimination of CO_2 . If this be really the case can we afford anything, however insignificant it may appear in itself, which conduces in any degree to the healthy metabolism of this epithelium, which plays a part somewhat analogous to that of the cells of secreting glands, by which they select some substances from the blood, while rejecting others.

Whether this be true of the alveolar epithelium or not, there is another reason for which this practice of respiratory exercises may act as a potent factor in the recovery of the damaged lung tissue. Bearing in mind the disposition of the lymph

lymphatics of the lung into superficial and deep systems, and the wonderfully intimate communication between these it is impossible not to conclude that the process of absorption is largely influenced for good by voluntary deep breathing at stated intervals. Knowing that, although phthisis is a specific disease, the initial morbid changes in the tissue where the bacillus gets a footing are closely allied to those of inflammation in general, and that it is not until later we get the characteristic caseation and fibro~~x~~sis, it is all important to get rid of the early products of inflammation as speedily as possible, in order to facilitate the re-assertion of that recuperative power which seems to be inherent in the tissues. That this power is a reality, whether we can scientifically explain it or not, leaves little room for doubt, for do we not see Nature in all but the most acute cases of tubercular disease, making heroic attempts at limiting the destructive effects of the bacillus by the formation of fibrous tissue, which ultimately is successful in heading off the disease if only the constitutional vigour be improved and maintained?. The radicles of the lymphatics in the alveolar walls being in communication with the interior of the alveoli by means of pseudo-stomata. while the perivascular and peribronchial vessels also freely anastomose with one another and with the subpleural lymphatics, which are again in communication with

the pleural cavity by means of stomata, we have here a magnificent arrangement for effectually getting rid of the products of disease. It is of vital importance that this guardian system of lymphatics should be aided as much as possible in the due carrying out of its benign purposes; and we can intelligently do this when we bear in mind that inspiration distends the lymph vessels and their stomata, and that they are again compressed by the expiratory effort.

Although this practice of "lung gymnastics" as it has been called, has not been carried out at Nordrach, it is quite possible that the wonderful results obtained there may, in some contributing measure, be due to the fact that Dr. Walther insists that his patients should do gentle hill-climbing at easy stages as early as possible. This is nothing but "lung gymnastics" in another form. I strongly maintain that we get the same good results by systematic deep breathing, and that this has the further advantage of attaining the same benefit without the expenditure of energy required in hill-climbing.

Now we come to the very important consideration of what special cases of phthisis pulmonalis are suitable for this line of treatment, for, no doubt, the unintelligent use of this practice in all cases might work irremediable mischief. Wherever there has been recent haemorrhage, or any sign of much breach of

tissue it should be studiously avoided. If, over a consolidated patch, we discover merely a want of symmetry between the breathing of the two sides, with increased vocal resonance and fremitus and that there has been no history whatever of haemoptysis, I should say that this was an eminently suitable case. Even if crepitation of the "fine hair" or "subcrepitant" variety were detected, I should still consider this no contra indication, but would advise that the exercises at first should be cautiously carried out. If, on the other hand, the râles be of the medium sized or bubbling crepitation character, or if there be any evidence whatever of cavity indicating considerable breach of tissue, I would not entertain a thought of this practice.

The kind of breathing that I have myself practised, and that I have also encouraged in others, is what is developed in voice production. In inspiration the mouth is kept closed, and the air taken in entirely by the nasal passages: and in expiration the mouth is open, and the patient encouraged to say "ah" while the abdominal muscles are called into play as much as possible, and thus ~~the~~ the diaphragm is most effectually elevated and the chest emptied.

To recapitulate, I wish to make myself thoroughly clear that in recommending this my aim is not so much the access of pure fresh air to the remote and diseased parts of the lung in order that it may act as a direct antagonist to the direct agent

of the disease, but that it may help to the recovery of healthy metabolism of tissue; and once this is accomplished all experience goes to prove that the bacillus is easily disposed of. Let really healthy tissue change be once established, and the body is placed in a position to fight its own battle. This is the supreme aim which we must ever keep in view in the treatment of all tubercular disease and especially of phthisis pulmonalis; and this end can only be attained by the perfect functional activity of the organs of digestion.

When the bacilli find a lodgement in the lung they first cause a proliferation of the fixed elements, and it is only after the lapse of some time that an inflammatory process sets in with exudation of leucocytes. Now whether these are the real agents in the destruction of the bacilli, and whether there is an active phagocytosis, as Metschnikoff and others hold, is not my sphere to discuss, but as a clinical observer one thing is abundantly plain to me, that immediately tissue-health is restored, the patient is within measurable distance of recovery. It is only a matter of time until the recovery is as complete as can be achieved in this disease, provided only the condition of tissue-health is kept in force.

The great reason for this is apparent. Probably of all pathogenic organisms, the tubercle bacillus takes longest to

develope, and is perhaps the least virulent until it has thoroughly entrenched itself in the tissues. Under these circumstances it requires the favourable condition of prolonged ill-health in order to its firm establishment. That this is beyond question is sufficiently proved by the large proportion of cases we come across in post-mortem examinations^h which show unmistakable evidence of healed tubercular disease. At some time of their history, under some depressing influence the normal vitality becomes lowered, the resisting power of the system is undermined, and the foe finds a lodgement, and works a certain amount of mischief. But presently, and before the destructive processes have worked irreparable harm, health again begins to assert itself, and by the conservative influence of fibroid developement the diseased area is effectually encapsulated, and its victim may not again show any sign or suspicion of the disease until it is accidentally discovered in the post-mortem room. This is Nature's revelation of her own peerless method of cure, or at any rate arrest of the disease, and we shall reap most success if we follow her inerrant guidance. Let the physiologist and expert determine the secret of the emigration of leucocytes and the large amoeboid cells of ^{the} connected ⁱⁿ tissue within the area of inflammation, and the ingestion of foreign particles by both these. The practical

physician can well afford to await the elucidation of the absorbingly interesting hypothesis of phagocytosis, it is enough for him to know that this particular disease-producing organism takes a long time to strike effectually, and requires the most favourable circumstances for its developement, and that immediately unfavourable conditions, such as returning vigour and strength begin to assert themselves, that moment the bacillus shows signs of wavering.

This leads to my contention, that as the stomach is in the great majority of instances the cause of this disease, so it is in every case the highway to its arrest, and cure if the latter be possible. I advisedly say that in every case the stomach is the royal road to success in the treatment of pulmonary and every other form of tuberculosis. Once we become fully apprised of this fact, it is marvellous the number of cases of phthisis we find to record a history of prolonged dyspeptic trouble, in some form or another long before definite pulmonary symptoms have directed our attention to the true cause of the whole mischief. And here arises the question, as to whether the prolonged functional disturbance of the stomach is a cause or a consequent of the disease. After the organism has securely established itself there remains no longer any doubt, that, on account of toxic action it is the pregnant cause of digestive, and many other

disturbances. But before this special period in its history is reached, when it has produced much local and constitutional change the question confronts us as to whether the bacillus is acting so insidiously, and in ambush as it were, that it is impossible to detect its presence by any clinical methods; and yet are we justified in suspecting its machinations, solely from the prolonged digestive disturbance, which eventually leads to general ill-health and definite pulmonary symptoms? Or does the functional derangement of the stomach, remaining in force for a sufficiently long time, merely prepares the soil for the development of the specific organism? The latter is, no doubt, the orthodox view, and however well sustained our suspicions may be it is not possible in the present stage of our knowledge to establish the former. Despite this fact, from my own personal knowledge, and from a somewhat extensive experience of a disease in which I have been compelled to maintain a painful interest, I am fully persuaded that it would be a most fortunate thing for our patients if we cherished the suspicion that the bacillus may act in ambush, and may possibly be the cause of dyspeptic trouble which it is impossible otherwise to account for. Given a case, with a story of indigestion extending over a considerable time, from which we have eliminated every other possible cause of the functional indisposition, and I maintain that we

have not conscientiously discharged our duty to our patient, unless the chest has been stripped, and thoroughly examined with ~~a~~^{the} definite object of discovering the lurking foe. There are undoubtedly acute cases of consumption, in which a virulent form of the disease in concentrated strength runs a rapid and destructive course, during which the stomach maintains its healthy activity almost to the end. This does not in any way invalidate my earnest contention, that functional dyspeptic trouble in a very large number of cases, inaugurates phthisis. We are not at all likely to miss the real state of matters in the markedly acute cases. There is no ambush here - the real foe immediately announces himself. It is in the chronic cases, in which the invasion is slow, that it is of supreme importance to detect the true cause of ill-health at as early a date as possible. From their very chronicity these cases augur a remarkable resistance and antagonism to the effects of the bacillus, and if we can only arrive at an early diagnosis, they par excellence give abounding promise of complete arrest of the mischief. It is quite true that in acute cases stomach symptoms need not be prominent, but in a very large majority of cases, and what is of paramount moment, in a large majority of curable cases, indigestion acts as the advance body of the main army. Let this be ignored, and

irreparable evil is the consequence.

Far and away the most important thing in the management of those suffering from tuberculosis of the lungs is early recognition of the disease. In this connection too much stress has been laid on pulmonary symptoms. They have been considered of prime importance. They are nothing of the kind; and the man, who considers them as such, will never sufficiently early recognise the presence of phthisis. When symptoms are tangibly connected with the respiratory system the mischief has obtained a somewhat serious footing. I contend it is of prime importance that we should recognise the invasion of the disease long before this stage of definite respiratory symptoms has been reached; and were it not that my own mind was so impressed with the popular teaching that the early symptoms are chiefly connected with the respiratory system, I should have in all probability recognised the gravity of other premonitory symptoms much earlier, and would thus be in a more favourable position to successfully combat the invading foe which was not as yet strongly entrenched. As it was, the fortunate hour had passed, and instead of being now on the "flood-tide" of health, one is doomed to the "shallows" of a wretched existence, where life, instead of being an equipment for some achievement, is but a mere burden: and all this because of the fatal error of attributing too much importance to respiratory symptoms. Not that [^]one can attach too deep significance

to them, but that there are other symptoms earlier, and therefore of far more consequence because the physician is placed on a vantage ground for the arrest of this fell disease.

There are other facts that strongly point in the direction of the bacillus being at work long before we can detect its presence by any clinical methods. Let us look at the disease etiologically, and see how frequently it is interned in the glands, without giving any further manifestation of its presence. A man is subject to follicular or ulcerative sore-throat, and in this condition enters an atmosphere charged with tubercle bacilli, which on account of the breach of surface get entangled in the lymphatic spaces, and ultimately the bronchial glands become affected; but robust vigour is quickly recovered and the disease may never proceed farther: on the other hand let vitality continue in a lowered condition and phthisis will develop secondarily to the primary tubercular focus in the glands. How frequently again we find tubercular meningitis in children, and it is only on post-mortem examination that we find there has been a primary lesion in the deep cervical glands or somewhere else. Thus to my mind it is quite possible that the bacillus may be the cause of the early indisposition and digestive disturbance we find in many cases of phthisis before there are any definite lung symptoms.

As nearly 45% of the deaths occurring in Great Britain between the ages of twenty and forty are due to phthisis, it is of vital importance that we recognise the disease at its very inception. It is pre-eminently a disease of that time of life when all the powers of mind and body should be in their zenith. Even from the low standpoint of political economy it is of the utmost consequence that this fearful waste of life should be arrested. The decimation it works in the ranks of our young and promising is so great, that we must bend all our energies in the direction of stemming its devastating tide. All experience goes to prove that the prospects of recovery are immensely brighter if the disease be detected and scientifically treated at an early stage. What are then the signs by which we are enabled to detect its presence before it has wrought irreparable harm? I have already discussed the importance of persistent functional disorder of the stomach, and however slight it may be it should never be lightly dismissed. As physicians we are too apt to forget that a large proportion of really serious organic diseases begins as slight functional disturbances. Due attention to this symptom will in a great many instances put the physician on the right line, and place the patient in a position in which he can reasonably entertain hopes of ultimate recovery. Not only that but recovery at an early date when he is saved from much mental anxiety, besides much loss of money and of time.

In conjunction with this obstinate symptom I should place next in importance any obscure pain in the chest which has persisted for some time, and especially if it be of definite localisation. Pain is so often enumerated as a symptom of disease that we are greatly in danger of missing its significance. The pain which I now refer to, and which I believe in my own case was a trumpet blast warning of impending danger, has nothing whatever of the character of the usual pleuritic pain. I have already referred to it in detailing the history of my case as a dull, dragging pain, which for a full year prior to any definite lung symptom clung to me with the pertinacity of a poor relative. Literally it was "always with me". Immediately I awoke in the morning, and all day long I was conscious of it. It was never severe, but of a gnawing, dull, toothaching nature, and very depressing. It was of most definite localisation. I attached no importance whatever to the vague sort of pain that some neurotic patients complain of as being here, there and everywhere all over the chest. But given a dull pain, intelligently described, and circumscribed in area, and especially if it be confined to the region of the apex, and I am much mistaken if it is not of considerable diagnostic value. Mine was limited to the upper lobe of the left lung, and it felt exactly as if the pectoral muscles had been over-fatigued, and I came to the conclusion it was ~~my~~ myalgic

and due to the fact that I always expressed the placenta with my left hand.

Pain on coughing is frequently referred to as being felt over the seat of the lesion. The pain that I am now drawing special attention to has no connection whatever with coughing, and it was in force in my own case for fully twelve months before there was any sign of cough or any other distinctive lung symptom.

For the past three years while practising in Western Australia I have been fully cognisant of the great value of this pain as an early sign, and my clinical note-book records it in a very percentage of my cases. Recently while in charge of a consumption sanatorium accommodating eighty patients I made a special point of investigating this symptom, which hitherto has not received the attention it merits, and fully one third of the cases examined could distinctly recall this dull pain for some considerable time before the breakdown, which necessitated cessation from work. Herein lies its chief diagnostic interest that it is distinctly ^{ly} premonitory, and is in force as in my own case for months before there are any other symptoms pointing directly to the lungs.

As to the exact nature of this pain I am not at all clear. The electrical method may throw some light on it, but we must never forget the fact that peripheral neuritis is, in a large

number of cases, closely allied to phthisis - and the probability is that it is a latent form of peripheral neuritis, but whatever may be its explanation, its definite localisation in the chest-wall corresponding to the seat of disease in the lung is what is of supreme interest to the clinical observer. It is not of the character of cutaneous hyperaesthesia, but is more referable to the muscle substance than any other part of the parietal tissues. Whatever its true nature I am convinced it should not lightly be disposed of, and we must beware of dismissing it as merely "hyst^{er}ical". How often has this term led to disastrous consequences when nature has been giving us timely warning of some impending danger, and because of this abominably misused word we fail to interpret her meaning, and the golden and redemptive opportunity is lost. I have read somewhere of the case of a girl of sixteen who suffered from lassitude - no other definite symptom except a fixed pain in the upper part of her chest. Her physician explained the whole thing, as he thought, by attributing the illness to anaemia in a girl of strong hysterical tendencies. His attention was directed to the pain but the magical word "hysteria" accounted for it. Sometime elapsed without mitigation of this dull pain or much improvement in her general condition, when another physician was consulted who on physical examination discovered actual tubercular mischief in the region

where the pain was complained of. After such instances of disaster arising from the boundless faith of some men in the possibility of all pain of an indefinite character being explained by "hysteria", one feels the urgent necessity there is for teachers to restrict the application of this term.

Remembering that it is the aggregation of many otherwise trivial things that makes circumstantial evidence of such overwhelming importance, and sheets home guilt to the real offender, the physician, who finds a history of dyspepsia, associated with any obscure well-defined pain in the chest, particularly if with this there is a feeling of lassitude and general indisposition, should make a thorough examination of the chest even if ~~there~~ there be no cough or expectoration. If on doing so he find any divergence in the symmetry of the physical signs of the two sides he is amply justified in suspecting phthisis pulmonalis, and without in any way alarming his patient, it is his ^{bounden} ~~boundant~~ duty to begin treatment at once. Waiting for confirmatory evidence in the way of bacteriological examination of the sputum, which does not yet exist, before definitely assailing the foe whose presence he may be well nigh sure of, is unpardonable. Bearing in mind the physiological difference between the two sides, we are not likely to attach undue importance to the slightest departure from symmetry, but if in addition to this we find any adventitious sound such as even the signs of a localised bronchitis,

I hold that the diagnosis tentatively is quite sufficiently clear. If the signs of bronchitis be general I should attach no importance whatever to them as an early indication of phthisis, but knowing that the bacilli in the early stage cause a proliferation of the fixed tissue elements we may in this way get a localised bronchitis entirely due to their agency. The more localised it is the more likely to be tubercular.

To be dogmatic in ones' diagnosis before the bacillus has been microscopically discovered in the sputum, and before there is anything but vague indications of impending lung trouble, may be unwise and not according to the methods of the scientist who should always be in possession of incontrovertible facts to sustain his position. Further it may leave him exposed to the charge of being an alarmist, if the patient happen to consult another physician largely devoid of keen powers of observation and scientific acumen, but possessed of that delightful charm of manner by which he dispels all apprehension by a significant shrug of the shoulders, and thus assures the patient "there is nothing the matter with your lungs". All this professional disaster may be avoided by putting in a saving clause, but whatever be the consequences, by all the solemn responsibilities of our position as medical men let us begin treatment early, for the consequences of parleying with the foe at the beginning may

be disastrous beyond all power of reparation.

Before finally departing from the early signs of this disease I should like to say a word about Influenza. Although there is quite a sufficient difference microscopically between the bacilli of tuberculosis and Influenza, clinically one is almost driven to the conclusion that they are intimately related. How frequently do we find a history of Influnza ending in consumption, and this in a remarkably short time, and in a case otherwise considered perfectly healthy ^{kill} to the period of the Influenzal attack.⁷ Not only does it wake up into fresh activity phtthisis which has been quiescent, but it seems to have the power as no other disease of preparing the soil for the growth of the tubercle bacillus. It appears to me that in many cases it is a precursor, not alone in the way of lowering vitality and thus lessening the general resistance of the body to the inroads of the more serious disease, but that many cases of so-called Influenza are mistaken for the early febrile symptoms of phtthisis pulmonalis. Is it not possible that in a susceptible nervous organisation the toxic effects of the tubercle bacilli may give rise to symptoms strikingly resembling Influenza before we can detect any physical signs in the lungs? It seems to me that in my own case this was really so; but be this as it may the history of repeated attacks of Influenza should make us very ~~sus~~

suspicious of the graver disease not being far in the rear.

To sum up - If we have a case recording a history of (1) chronic indigestion with (2) the particular pain which I have described, and that on physical examination of the chest we find (3) any divergence in the symmetry of the signs of the two sides, and especially if this be associated with (4) any adventitious sound however slight we are justified tentatively in making a diagnosis of phthisis - and if, over and beyond this there be a history of repeated attacks of Influenza our diagnosis amounts almost to a certainty.

Assuming that the case in question is one of incipient consumption - that we have indeed confirmed our diagnosis by microscopic examination and demonstrated the presence of the microorganism which is the real agent in all cases of tuberculosis, what reasonable hope can we ourselves entertain, and what confidence can we extend to our patient that recovery can be ultimately achieved? This is a question which is extremely debatable and despite the magnificent progress that has been made in the elucidation of the principles that should guide us in the treatment of phthisis since Koch made his memorable discovery in 1882 "there remains yet much land to be possessed" I shall never forget the crushing effect with which the intelligence was brought home to me that microscopically the bacilli were demonstrated in

my expectation, and that my wretched health was due to the fact that they had to all appearance obtained a permanent footing in my system. At that time the open air treatment was "booming" in the medical world, and high hopes were entertained that the fearful mortality from consumption would be greatly reduced by its beneficent action. My chief medical adviser in Melbourne in whom I had boundless confidence as a thoroughly capable man of science, and as an unswervingly honest man, assured me on the basis of data that to my mind were quite convincing, that in twelve months I should be quite myself again. From that moment I set my face resolutely toward recovery, and determined to give open air methods a thorough chance of vindicating their right to my unqualified allegiance. My adherence to the principles of the treatment was so strict, that on looking back I cannot upbraid myself with any vital departure from the pathway of exact obedience. My mental state was in every way conducive to that repose which enables the organs to carry out their functions so harmoniously that the tissues in general can re-assert their native recuperative power. The reasons for this state of perfect mental calm were two-fold: The spes phthisica had completely taken possession of me, and my exchequer was fortunately in that *cond.* *tion that* I need have no anxiety whatever financially - an elysian state into which alas! the larger proportion of consumptive patients

can never enter. And yet despite all these favouring circumstances my sanguine expectations were not realised even at the end of two years. If the prospects in such an ideal case are not brighter, what about the great army of the rank and file who cannot possibly be placed in such an auspicious environment? What about the bread-winner who though fully apprised of his imminent peril dare not think of relinquishing the implements of toil but for a brief space? No wonder that the mortality from this cruel scourge is about two and a half times as great among the poor as it is among the middle and upper classes. There is a cruel but true irony in the classification of the French writer who said there were two kinds of phthisis - that of the rich and that of the poor - the former being sometimes cured, the latter never. Lately I had the privilege of spending the greater part of the day with a gentleman of means who has taken a keen interest in open air sanatoria, and who is himself a member of the committee of management of one of the largest sanatoria for the working classes in Great Britain, and he had to confess to me sub voce that despite excellent temporary results, everyone of their patients was in the grave within five years of their leaving the institution! In the light of my own experience and in the face of such testimony I am inclined to say of phthisis what some one has long ago said of Syphilis that "it is a disease that makes truce but never makes peace".

This naturally raises the question of the latency of the disease.

Having once obtained a footing in the body, does it forever afterwards refuse to evacuate the territory which it has invaded, and although the bodily vigour may circumscribe its operations, and hold it in check to such an extent that we are hardly conscious of its presence, yet, is it always there and only awaiting the favourable opportunity of re-asserting its destructive powers.? At the present stage of our knowledge this question is not easy of solution, partly on account of the varied forms in which the disease manifests itself, but more especially on account of its extraordinary behaviour under apparently similar circumstances. How frequently have we seen ^{cases} two typical of Phthisis in the so-called second stage, and as far as we could judge the analogy between them was exact - the personal and family histories were equally favourable - on physical examination we found not only the progress of the disease the same in both, but the area of the lung involved also similar - they were treated under exactly like circumstances, and for a time they both gave promise of recovery, but they came to a parting of the ways, and unaccountably, as far as we could see one made uninterrupted progress and the other went steadily downhill. Of course this might be accounted for by assuming a difference in the virulence of the micro-organisms, as well as in the resisting power of the tissues in the two cases; but/

but do we not just as frequently witness a case doing steadily well for a time, and indeed gaining so much in physical vigour that the disease appears to have been eradicated, and yet without any fresh exposure to infection, after a period of quiescence there is a recrudescence of the old mischief and "the last end of that one is worse than the first." Take my own case as an example - for many years my working weight was 9 stones 5 lbs and this was steadily maintained under varying circumstances of climate and work for at any rate 10 years, so that although somewhat under the average I regarded it as a healthy working weight. On becoming affected with tubercular disease my weight went gradually down to 8 stones 7 lbs, when I put myself on the open-air-rest treatment, and within 18 months I went up to 11 stones 5 lbs - exactly 2 stones heavier than what I was accustomed to regard as my normal weight. In this excellent condition of flesh my symptoms had largely vanished, and while still maintaining this ideal weight after three years I returned to general practice in what I considered an equable and excellent climate. I took every care to perpetuate the circumstances under which I had so wonderfully recovered and clung tenaciously to open air principles, with abundance of excellent food and as much rest as I could possible command: and yet after two and a half years work my weight went steadily down, my cough and expectoration came on again, and I was once more in the power of the hateful bacillus. Does this not look like a recrudescence? the mischief being there though controlled for a time, and immediately the favourable moment came asserted its ascendancy/

cendency? Personally I have no doubt of this, and I think it sufficiently explains the rapidity with which the great majority of our Sanatorium patients go down-hill very shortly after returning to their work, and I fear I am driven to the conclusion that by open air methods alone consumption will never be cured. It may be felt that my forecast is pessimistic, and largely overshadowed because of my own story. No - I'm still sanguine, and I mean to advocate a more thorough and more protracted application of the open-air treatment as we now know it than ever I have done before, but I mean to supplement it by what I consider a most vital adjunct which I shall presently discuss. If we are ever to accomplish anything toward a cure, and not the mere suppression of this hateful scourge, we must face the facts however depressing, and own that our anticipations of open-air methods have not been realised. It is only by facing the facts that, although presently baffled, we can rise to better achievements. When the disease is allowed to run its course unhindered - that is when no treatment whatever has been brought to bear on it - it seems to pursue its way by a series of alternating exacerbations and remissions, and according as the remissions are short or long the disease is acute or chronic. Despite our trumpet blowing it seems to me that all we have hitherto accomplished is to prolong the remissions and thus enable the tissues to recover themselves sufficiently to carry on the struggle for a little longer. I do not wish in this controversy to lose sight of these cases of apparently hopeless outlook in which the disease is arrested, and remains quiescent for years; nor in any other way to underestimate the excellent work that has already been done - indeed it would appear at times as/

as if the disease were not only brought into subjection but entirely eradicated; but these cases are rare. I do not think that Baumgarten's conclusions are substantiated, if I understand his position aright, that tuberculosis is hereditary in the same way as syphilis, and that it remains latent in the bones or glands where we find it so frequently in children, and that this seed with which the child is born springs into life whenever the individual resistance of the tissues is lowered. What I do hold is that tuberculosis is in every instance an infection, ^{but} ~~and~~ that once contracted it abides permanently, though controlled and held in check by the improved vigour of the tissues, and that as ^{soon as} the tissues again become vulnerable the latent mischief lifts its hydra head. This I believe to be the true state of matters, and that the frequency with which we meet with the disease in the bones and glands of children has a quite different explanation from Baumgarten's theory of hereditary latency. The theories of natural and acquired immunity are at present much too problematical for the general practitioner to discuss but thus far everything seems clear, and all are agreed that the cells of the body and especially the leucocytes are in some mysterious manner endowed with a wonderful power of combating the active agents of this disease. Now this being the case is it not exceedingly probable that nature is bending all her powers toward attracting the bacilli to the lymphatic glands and ^{bone-marrow} ~~bone, and marrow~~ where the leucocytes are largely manufactured, where they are numerous, and where being young they are also likely to be strong, and thus in a better position to wage successful warfare! May not this after/

after all be the true explanation of the frequency of tubercular deposit in the bones and glands? When I began this argument I had no idea of getting into such abstruse quarters and I confess I am anxious to extricate myself as speedily as possible as these difficult problems must be left to the physiologist and bacteriologist; and after all the question of burning interest to the ordinary practitioner is how to successfully lead his patient back to perfect health, but in order to grasp this principle of scientific medicine, he must have an intelligent conception in his own mind of the true meaning of the term; "latency" when applied to this disease.

According to my grasp of the subject, latency must be restricted to a quiescent or dormant state of the disease which must have been previously contracted by infection and not transmitted by heredity according to Baumgarten and his followers. This problem having been so far elucidated the question now arises as to the ultimate success of treatment - are we merely able at best to hold the disease in this quiescent condition, or can we intelligently hope to finally eradicate it, though not able to confer on the system an immunity against further infection?

The great polestar which should ever beckon us forward is the fact that the tissues generally are endowed with forces antagonistic to the development of phthisis, and that these antagonistic forces are in effective strength only when nutrition is perfect. Whatever difficulties lie in the way of the solution of many abstruse physiological questions, there is a general consensus of opinion on this all important point, and the clinical observer/

observer may rest here. In this he has a lever by which he can work a great deal of amelioration in the ravages of tuberculosis, by which so many thousands of our young and promising are swept into the grave annually. Whether it be a fact that a whole million of the population of Europe alone die of this scourge every year, it is undoubtedly responsible for a sufficiently large number to constrain us as medical men to bend all our powers toward its eradication. The whole question is "exceeding broad" and must engage the attention of the scientist in his laboratory, the political economist in the legislative assembly, and the general practitioner, who is more than any other brought face to face with the fearful havoc it works among our poor and underfed. At this point one is tempted to make an excursion into the domains of politics and rejoice that at last the public are being aroused from their stolid apathy to realise that we are constantly surrounded by unseen foes ever alert to engage in malicious war against us, and that much is being done toward a solution of the great problem of the housing of the poor. But so far we have only touched the fringe of this mighty question, and it is imperative that we take full advantage of the opportunity that education places at our disposal for disseminating knowledge, by which alone the great mass of our people will be made cognisant of the dangers to which they expose themselves. We must begin with our young - there is no use in "making frantic efforts to reform the dust and raise the dead" as Ruskin says - the old will not learn - We are simply faddists in their estimation. Why! it is appalling to me who has lived on open-air lines for the/
the/

the past six years, and by which undoubtedly I have been rescued from the grave, to find the apprehension with which people in Scotland regard the open window at night. The bogey of "night-air" is still with us, as if the atmosphere during the hours of darkness were charged with some noxious vapours from the pit, and the baneful thing must be excluded at all costs. So the windows are well nigh hermetically sealed after sundown, and the inmates of the large majority of our houses in town and country live in a vitiated and horrible atmosphere which cannot be tolerated by men like myself who have been living in the pure and natural air for years. I fear this ^{crude} ~~gross~~ ignorance is far more common in Scotland and Australia than medical men are aware of and it can be dispelled only by education. Let us cram our school books with useful physiological knowledge. Could not the story of phagocytosis be told with more enchain- ing interest than anything in such books as "British Battles by Land and Sea"! Here is a battle of present and absorbing interest to every one of us, and should be related with perfect fascination to our young until they dread an impure air as a "pestilence that walketh in darkness". Much can also be done by way of health lectures for the people. I fear our noble profession is a little starched and that on this account we are not sufficiently discharging our responsibilities as the guardians of public health. While in every way loyal to the noble traditions of a noble profession, I am convinc^{ing} ~~ing~~ that a helping hand might more frequently be extended in this way with- out/

out in the least violating our ideals of professional honour. Not only are our people in urgent need of enlightenment as to the principles of pure air, but also as to the principles of wholesome food - its nature, art of cooking etc., but much of this lies outside the domain of the general practitioner and I must not forget that it is as such I am now writing.

I have already urged the paramount importance of losing no chance of beginning treatment at the earliest possible moment. This is an essential principle in the management of every disease, but probably in none other shall we meet with such bright reward by faithful adherence to this tenet as in phthisis pulmonalis. It is not my intention to go into the minutiae of treatment as now accepted by the great majority of our profession - there is so much about which we are in a perfect state of accord, but it is necessary to emphasise certain things the importance of which we are in danger of overlooking, and it is my purpose to devote the remainder of this paper to a consideration of these points. Perhaps it would be well if I were to epitomise these according to their order of importance, and then proceed to discuss them severally.

1. Rest.
2. Stomach.
3. Open Air.
4. Food
5. Drugs.

REST:- I have placed this at the top of my list as its significance is in great danger of being lost sight of. When we are dealing with a broken bone we are fully apprised of the importance of rest - its need forces itself upon us and nature can only do her work in a very poor fashion till we come to her assistance/

assistance with our splints and other surgical appliances that ensure perfect rest. But in the case of a "broken" lung the circumstances are so different, particularly if it be in the very beginning of the disease. The patient walks into our consulting room and from his appearance it may be difficult to believe there is anything "broken" about him. The onset of the disease has been so insidious, and the symptoms are so vague that they speak with a very uncertain sound, and on physical examination we ~~do~~ ^{merely} discover a slight unsatisfactoriness of the percussion resonance, the expiration is slightly prolonged and perhaps a little wavey, and there is a slight exaggeration of the vocal resonance and fremitus, but beyond this there is nothing of importance. We detect no ~~creptations~~, not even "fine hair". The patient is told that he is not just quite himself - the top of one lung is slightly dull, but with care and tonics all will be well - and he is allowed to go about his work and we don't see him again for an interval of perhaps two or three weeks. Now I maintain that such conduct is unpardonable, and that it is our imperative duty in such a case to find whether there is any elevation of the evening temperature ^{and} if there ^{is} ~~is~~ to rest the patient at once. His lung is in an analogous condition to that broken bone, and the lung tissue can only mend itself by the whole man being placed in a condition of perfect rest. To dilly dally with a case at this stage is little short of homicidal. Now is the moment of supreme value, and it must be seized. How many have had occasion to curse the doctor for parleying with their disease at its inception! Wonders can be done at/

at this stage and to miss our opportunity may result in fatal consequences. If we only put our foot firmly down now, and insist on complete rest and "change" up to the hills where the air is pure and bracing, we shall accomplish as much in six months as we could otherwise do in as many years. All the old theories as to immunity have been abandoned and at the present time two only hold the field, viz, Mitchnikoff's phagocytosis and Ehrlich's side chain theory, and it is exceedingly likely that if neither of them solves the problem, yet in combinations they ^{offer} ~~affix~~ at the least an approximate explanation. To the physician dealing with a case such as I have sketched it matters little with which of them the preponderance of truth lies, all that he has to grasp is, that as a basis of both theories lies the all important requisite of perfect cell nutrition. He may not be able to follow the intricate windings of their arguments, but he can fully appreciate the goal which each has before him, and without which there can be no effective antagonism to the invasion of this or any other disease. The difficult question may be left to the specialist, but the revealed fact is ours as practising physicians, that apart from a healthy tissue-nutrition it is impossible for the system to carry the war against the invader to a desirable issue. Therefore let us leave no stone unturned that will help nature in this struggle. If the mental and physical drain of energy entailed in our ordinary calling be not for the time being suspended by insisting on absolute rest, we are not giving the tissues the chance for which they yearn; but if by perfect rest this current of energy be directed to a better nutrition of the cells/

cells and fluids of the body which are entrusted with the work of protection, even if recovery be not realised we have left no place for the sting of remorse as far as we ourselves are concerned. Without this rest, and that at the very earliest stage, it is impossible for nature to consummate her high ideal of the complete overthrow of the foe and the establishment of the body in a state of perfect health which alone is life. It is for this reason that men are right when they contend that the treatment should be called 'the open-air rest treatment'. Let us engrave the word rest in capital letters that we may ever hold it forth as one of the leading tenets of the principles of scientific healing. This may sound old and familiar, but it needs emphasis in the present day as much as ever.

After "rest" I place the Stomach as the second article of my creed, but indeed it is my first, and I have merely given rest the precedence because without it the stomach can rarely get into the condition of perfect functional activity. I find in this paper it is almost unavoidable not to repeat one's self. The successful attorney reposes great confidence in reiteration, and it may not be altogether out of place in the medical sphere. I have already said something to the effect that perfect digestion and perfect assimilation are the royal road to recovery from the destruction of tissue wrought by tuberculosis, and in discussing the part that pure air plays in this treatment I venture the affirmation that it is all important for the simple reason that apart from it we can never get a perfect condition of the stomach and all the collateral organs/

organs that are concerned in digestion. As soon as we know that blood-serum naturally possesses powers inimical to the life of certain pathogenic bacteria it should be our great aim in treatment to get the blood into as vigorous a condition as possible, and this can only be accomplished by ^{getting} ~~gilt~~ing and maintaining a healthy condition of the organs of digestion. There remains little doubt now that the substances in the blood which are engaged as the guardian police of the body are largely derived from the lymphatic glands and other organs engaged in the manufacture of leucocytes, and as all these organs are primarily dependent on the stomach, it is surely self-evident that the key to the whole situation is for us to do all in our power to facilitate its carrying out its functional activity as effectively as possible. The vague way in which men write in our medical journals, even at the present time, of fresh air being the cure of consumption, without grasping the great rationale of the treatment, is surely evidence that the editors are hard pushed for literary material.

The intimate vital processes of cell action concerned in conferring natural or acquired immunity are at present incapable of thorough explanation, but the facts of clinical experience, as well as the underlying principle of the two reigning theories, impel us to the conclusion that perfect nutrition should be the goal at which we should constantly aim. This gives the physidan a definite line of action along which he can intelligently work, and leaves little room for mere empiricism. Now in advocating this principle that perfect digestion should constitute the cardinal point in our treatment, I must not be

supposed to support the idea of indiscriminate drug-administration. ~~Later~~ on under the heading of "Drugs" which I advisedly place last, I shall give this point fuller consideration but meanwhile I would like to observe that if open-air methods are intelligently pursued the vis medicatrix naturae will do ^{her} ~~his~~ part so well that little room is left for the physician as a mere therapist. Whether immunisation goes on contemporaneously with the development of pathogenic bacteria and their toxins or not (though this is extremely probable) it is undoubtedly true that in health the fluids of the body are inimical to foreign germs in general, and that if it be placed in an environment where healthy nutrition can be assured, it is quite capable of elaborating its own anti-toxins.

At this time of day when so much emphasis has been placed on open-air, my conduct in placing it third on my list may be seriously called in question, but if I have succeeded in making myself sufficiently clear in the foregoing part of my argument, it will be easily seen that I do not in any way underestimate its supreme importance. Without it I maintain that tuberculosis can never be arrested, and personally I may say that I have developed an all consuming fresh-air hunger, and that it is simply purgatorial to me to enter a vitiated atmosphere. The railway carriages in Scotland I cannot but regard as hot beds of disease. In the North British Co. the windows in their corridor cars can be opened only to an infinitesimal degree - a mere little pigeon slit about 8 inches by 10 in the main window. Let a consumptive enter such a carriage and if he be ignorant of the imminent peril of expectorating

on the floor, what a perfectly ideal way of disseminating the disease! Though I have been in Scotland for the past three months I have not seen one letter in the public press protesting against such construction of railway carriages. Thank God, the heat of our climate in Australia makes such a condition of things impossible but at the risk of being accused of colonial "blow" I think Australia is far in advance of this country in enforcing the principles of sanitary sciences.

As to any danger of contracting catarrhs and the many other ailments supposed to be due to exposure to fresh air in cold, blustering weather, my own experience completely dispels the fear. Before undergoing this heroic treatment, I was subject to constantly recurring colds, but now my constitution seems so hardened that I can live and thrive in any weather provided only the air be fresh and pure both night and day. In the hills in Victoria where I underwent the treatment we had slight snow in the winter, plenty of mild frost, fogs and a heavy rainfall, and under these circumstances I frequently awoke at night with a perfect gale of cold wind blowing on me and yet I never contracted any harm. My house, being a bungalow, there was a verandah five feet wide all round, and I merely changed my position, according to the directions of the wind. Sometimes I took the precaution of having a folding screen to shelter my head somewhat, and frequently had the experience of being aroused by the screen being blown down on top of me and yet from the very first day I began treatment in this ^{position} ~~position~~ I bade farewell to my "colds". I do not think as a rule, that tubercular patients are at all subject to

"colds" despite the teaching to the contrary; and certainly not when they are thoroughly launched out on open-air lines. In the Winter, when the weather was crisp and cold, and even when it was wet and foggy, I made steady progress. It was only in the Summer that there was any halt in my advance. I attribute this entirely to the fact that cold increases ~~K~~atabolic change, and in consequence, more food must be consumed, in order to make up for the increased loss, so that there is a constant interchange of material in the tissues. Metabolism is thus in a constant state of greater activity, and there is little doubt that this is conducive to restoration. As stagnant air or water is always less pure than the same element in circulation, it is only reasonable to suppose that great activity of ^lcelular change is eminently desirable, especially as this can be brought about without fatigue to the patient, by placing him in an environment where the air is cold and bracing. If the air be dry and cold so much the better, but there should be no insuperable difficulty to the carrying out of this treatment, however damp and cold it be, provided only it be pure. This is the indispensable requisite. Personally I never suffered any inconvenience from extremely wet weather, and I should infinitely prefer a too wet climate to one that is too sunny. Before the principles of this treatment were thoroughly grasped, we were in the habit of sending patients to the Riviera, Madeira, and other Southern latitudes, and we found they returned materially improved; we attributed the amendment to the fact of their residence in sunnier climes than our own, and thus the sun got the/

the credit which was wholly due to the open air, and so the mistake has been perpetuated, and it remains to this day with a great many medical men. The consequence is that consumptives are not exposed as they should be to the life giving qualities of pure cold air, even if it be wet and stormy. After my first twelve months of treatment I positively enjoyed wet and boisterous weather, and irrespective of the low condition of the mercury I braved the elements even when the healthy sought the shelter of their homes. I am certain that this mode of life will never harm the tubercular if he only live regularly, never "overdo it", and always retire before nine o'clock. On the contrary, his appetite is gloriously whetted; his digestion is so perfect that he never knows he has eaten; and he has that indescribably delightful feeling that, every day, he is gaining ground.

Who but the one that has felt that his life was doomed can thoroughly appreciate this? When the patient is on the high road to recovery, and in a condition ^{really} ~~ready~~ to enjoy this life, what is to be guarded against more than anything else is over fatigue of mind or body. Indiscretion in this direction will certainly cost many additional months of treatment, and it is for this reason that medical supervision of the phthisical is so imperative. One other mistake must also be avoided: this treatment must not be stopped prematurely; as a rule it is much too short; arrest of the mischief is not sufficiently established; the whole thing is only a patchwork, and sooner or later, there is a relapse of the whole miserable thing, with all its unutterable weariness.

The food of the consumptive undergoing this treatment is a most vital consideration, but no insuperable diffi-

difficulty need be experienced here, if only the digestive system be made the focal point of all ^{lines} our ~~lives~~. A very short time in the open air enabled my stomach to do its work in so effective a manner that my eating capacity astonished my friends. Nitrogenous food entered largely into the composition of my diet. Three times a day I consumed it in some shape or form, and I always supplemented each meal by a pint of rich, creamy milk. I got two Alderney cows, but as I was not quite sure of the health of one of them, I confined myself to the milk of the other. It is here that the great value of Koch's tuberculin still holds sway. Every cow should be subjected to this test, and if there be any reaction, pointing to tubercular disease, its milk should be rejected, no matter how sleek and healthy the cow may appear. Great attention should be directed to the udder, for in spite of Koch's protestations that bovine tuberculosis is not easily communicated to the human subject, the recent commission has arrived at conclusions subversive of this eminent scientist's opinion, and the report of the Royal Commission appointed in 1895 to enquire into the effect of food derived from tuberculous animals on human health says: "According to our experience then, the condition required for ensuring to the milk of tuberculous cows the ability to produce tuberculosis in the consumers of their milk, is tuberculous disease of the cow affecting the udder. It should be noted that this affection of the udder is not peculiar to tuberculosis in an advanced stage, but may be found also in mild cases. The milk of cows with tuberclosis of the udder possesses a virulence which can only be described as extraordinary. All the animals in-

oculated shewed tuberculosis in its most rapid form." Now it may be argued that boiling for a very short time obviates all this danger, but I am still among those who hold that unboiled milk is much more preferable and palatable. I do not see clearly why boiling should interfere with the efficacy of milk as an article of diet, but there are some facts that would support this conclusion. A few years ago we had what might be called an outbreak of scurvy-rickets in the children's hospital in Melbourne. At that time the institution was supplied with milk from the Bacchus Marsh Concentrated Milk Co., and naturally the milk supplied was suspected as being in some way accountable for the extraordinary prevalence of the disease, particularly among children under three years of age. The milk was subjected to the most thorough examination, and it in every way responded to the ideal standard of really good milk as far as the percentage of proteids, butter, lactose and salts was concerned. Bacchus Marsh, from which the milk came, is one of the finest and healthiest dairying districts in all Australia, and the herds which had been carefully examined by the government inspector of stock, were pronounced as being in ideal condition and free from all disease. The cause of the outbreak - for its prevalence was such that it could not be otherwise designated - seemed to be shrouded in mystery; but ^{despite} ~~dispute~~ the favourable reports concerning the milk, the district, and the cattle, some of the physicians still suspected the concentrated milk of being at the foundation of all the evil. Their patients were forbidden to partake in any way of this milk, with the result that in four or five weeks all symptoms of the disease

vanished from the children thus treated, without the administration of fruit-juice or any other adjuvant. The case against the Bacchus Marsh Concentrated Milk now seemed quite clear, and the most searching investigation was carried out with the result that the milk was still found chemically, bacteriologically, and in every other way pure and up to standard. On microscopic examination, however, it was found that the oil globules were entirely broken up, and in this way the molecular constitution of the milk was so interfered with that undoubtedly it was the cause of the whole outbreak. In the process of concentration the milk had to be subjected to a very high temperature and this accounted for its changed molecular constitution - otherwise it was perfect milk, and I may add, that no salicylic acid, "preservitas", or any other chemical was found in it. This case, more than any other I have heard of, seems to me to support the contentions of the advocates of zomothera^{by}₃₀₄, or the treatment of tuberculosis by the administration of raw meat or muscle ^{plasma.} ~~placmen.~~ We must remember that Richet and Hericourt, who were the pioneer experimenters in this department, held that the raw meat and its juices acted, not so much as a form of alimentation, but that it possessed antioxic powers, which were destroyed by cooking. Personally I have consumed raw meat minced finely and disguised in sandwiches, with a plentiful supply of salt and mustard, but could never persevere - it was always revolting to me. I have, however, seen some cases undoubtedly benefited by it, and one case I should certainly say saved. - A boy of sixteen in Western Australia, with an excellent family history, but he developed tuberculosis and went

rapidly down hill until his bones could be literally counted through his skin - the emaciation was a very marked feature of the case. I had abandoned all hope of his recovery, but just at that time read an article in one of the medical journals by Dr. Leonard Robinson, on the importance of raw meat as a food for the phthisical, and with the proverbial alacrity of the drowning man, I clutched at what I feared might be a straw. From the very outset my patient took to raw meat like a carnivorous animal. He developed a special liking for sausages as they came from the butcher, and would eat them out of his hand with great relish, as the average boy would eat a "stalk of rock". After two months on this treatment he began to show signs of amendment, and he gradually went on to what looked like perfect recovery within fourteen months. This was three years ago; I saw him a few days before I left Western Australia in January last, looking well, and at his work. I am sorry to say that I have never come across a case since that developed a taste for raw meat as Willie G.- did. In the light of this case, and the experiments on dogs, that have been carried out by Richet and Hericourt, I should advocate raw meat, raw milk, and raw eggs, under all possible circumstances, but would exercise great care that the milk be derived from really healthy cows - a precaution equally necessary with regard to the meat.

DRUGS:- As to these I have little to say. Creosote and all its derivatives, creosotal, guiacol, guiacol carbonate, benzoates, cacodylate of sodium, and arsenic I have consumed myself in no mean quantity, and if our object were the upsetting of the/

the healthy process of digestion, then, in my case, they were excellent in effecting this purpose. All drugs I cannot dis-
~~cuss~~^{miss} in this summary fashion, and there are three that specially merit our careful attention - namely, iodine, iron, & mercury. I am so glad that there has recently been published a new edition of Dr. Wm. Murray of Newcastle's little book "Rough Notes on Remedies." In this volume not a word is written so far as I can remember, of the use of these three special drugs in tuberculosis, but he calls attention to the danger of neglecting our old friends in these days of much lauding and advertising new remedies. In all cases of phthisis there is an impoverishment of blood, and, as it is supposed to be one of the alexines of Ehrlich that gives blood serum its power against pathogenic bacteria, any drug that really enriches the blood should never be lost sight of as of possible service in the treatment of this disease of which anaemia is so often a prominent symptom. It is in this connection that iron, and especially its carbonate, may do excellent service in the early stage of phthisis, but we must never forget the old injunction that the stomach must be in essentially good order before this drug is administered - and indeed I should be disposed to lay it down as an axiom that any drug in any way interfering with the processes of digestion should be immediately abandoned.

Let us hope the day is not far distant when it will be possible to effectually approach the treatment of tuberculosis from a standpoint different from that which we have at present. All we now aim at is to so improve and raise the standard of cell/

cell nutrition in the body invaded by the bacilli that it will successfully fight its own battle. If at the same time we could assail the foe directly by a drug that would eventually slay it, what a day of rejoicing for the thousands of our fellow sufferers all over the world. Is it possible that Mercury may prove itself to be this beneficent agent? There is no doubt that there are some striking ^{of} parallisms between tuberculosis and syphilis, such as the chronicity of both diseases, the tendency to the formation of degenerative and fibroid changes, the secondary remote affections, and also a certain amount of resemblance pathologically ⁱⁿ to the initial lesions.

The real cause of tuberculosis is undoubted - the real agent in the causation of syphilis is still in the region of the problematical, although there are many things that point in the direction of its bacterial origin. *If* the observations of Lustgarten be verified by further evidence in the near future then the analogy between the two diseases is more striking still, for the bacilli present a great similarity as to their size, and behaviour towards some stains. But apart from the purely scientific aspect of the question I have taken this drug myself, and can testify to its marvellous power in raising one out of the realm of gloom into comparative bliss and mental sunshine. How frequently has the physician heard the syphilitic patient speak in the same strain of the beneficent effect of ^{this} ~~the~~ drug. It seems to possess a wonderful power in promoting metabolic change and making one feel that life's machinery is moving more smoothly and effectively. This very effect argues a specific action; for those free from disease, as a rule manifest a marked idiosyncrasy to its action. Unfortunately I cannot speak authoritatively from the personal stand point. I have taken the drug for about four months when under treatment in the hills of Victoria, but finding that I had put on so much flesh, and that my symptoms had vanished, I abandoned its use, so that I am not in a position to dogmatise. The great reason that induced me to try the drug is that it is one of our most potent antiseptics, and is of signal use in other germ diseases; and then there is what seems to me a striking likeness between syphilis and tuberculosis, and in the former disease it has done such yeoman/

yeoman service. I am still convinced that there are great possibilities before mercury in tubercular disease, and I have lately recommenced it, and almost immediately experienced the old feeling of general well-being. In order that the issues may not be in any way equivocal I am taking perchloride of mercury simply dissolved in distilled water, and in doses of one sixteenth grain three times a day. In order to thoroughly test the efficacy of the drug, its administration should be continued for the same time as advocated in syphilis - and, of course, with all precautions. It is remarkable how quickly one begins to feel cold when under the influence of mercury, but I do not think this is any contraindication, provided one is clothed warmly and uniformly in woollen material. I shall now close this paper by citing a case the diagnosis of which was beyond all possibility of doubt, and which responded in a phenomenal fashion to the action of mercury when recovery seemed hopeless. As I have not my clinical note-book with me, in which the case is reported, I cite entirely from memory. Nearly three years ago I was consulted by a girl of twenty-two, suffering from very obstinate chronic constipation - she complained of a ~~very~~ general feeling of uneasiness all over the abdomen, but no definite pain. On careful examination nothing of a pointed character in the way of diagnosis could be arrived at, and her condition I attributed largely to sedentary habits, as she was a student in one of our Government Colleges. There was no rise of temperature nor anything else indicating serious mischief. Menstruation was regular, and her personal and family history were all that could be desired. As I was the family physician I had

every opportunity of observing her case, and for two or three months ^{the} chronic constipation was overcome by drugs and careful dieting, and she proceeded with her studies; but at the end of this time I was again consulted, as she said her abdomen was steadily enlarging, and she had a painful feeling of tension that made her quite uncomfortable. There was some elevation of temperature, and I ordered her home to bed. On further exhaustive examination nothing satisfactory could be arrived at. There was an undoubted enlargement of the abdomen - not a prominence but a general enlargement, with a feeling of tension on palpation, and a somewhat increased resistance and dulness of percussion, with slight pain on pressure in the right iliac region. As Typhoid was prevalent at the time this fever was suspected, and a trained nurse was put in charge. Her temperature chart would have been taken by any one as typical of Typhoid, but it ran a course of thirty-two days and I was never satisfied that it was typhoid fever - neither was the consultant I called in to confer with early in the case - there were no rose-spots - the abdomen continued to enlarge uniformly, with slight bulging in the flanks, where the note was dull, though one could not feel satisfied that there was fluid in the peritoneal cavity - there was no tympanites - the stools were not characteristic, and the general appearance did not indicate enteric fever - but the temperature chart was typical, though it ran a protracted course, and there was pain, on pressure, in the right iliac region, so that the signs were very conflicting. After the fifteenth or sixteenth day she developed intense pain, of a colicky/

colicky nature, chiefly referred to the region of the transverse colon, which further complicated matters, and another consultation was sought to clear up the situation. This pain recurred at frequent intervals till the thirty second day, when her morning temperature was normal, though the evening temperature was still above a hundred F. ^(100.7) - and continued so for nearly a week. The only way this intense pain could be relieved was by a strong draught of nepenthe and tincture of belladonna. Once her temperature came down to normal there was no further relapse of fever, but the stomach continued as much enlarged as ever, and at irregular intervals there was recurrence of agonizing pain, always referred to the region of the transverse colon. No evidence of peristalsis could be made out, and on thorough examination under chloroform no sufficient relaxation of the abdominal walls could be got, even on complete chloroform narcosis, to enable us to arrive at anything definite. We came to the conclusion that there must be considerable adhesions, and accordingly, advised surgical interference. It was explained to the parents that the operation must largely be of an exploratory character, and that nothing in the way of a radical cure could be entertained, as the diagnosis was far from clear. The pain, however, became so unbearable that both patient and friends were willing to undertake any risk rather than have the present state of matters perpetuated. She was accordingly sent into a private hospital, and prepared for operation in the usual manner. On getting through the parietal walls a state of matters revealed itself which was ^{both} ~~not~~ unexpected and perplexing. It was impossible/

impossible to define the peritoneal cavity in any way - the ~~pari-~~tal and visceral layers of the peritoneum were so adherent, and so enormously thickened, that no distinction whatever could be made out between them - and what added to our dismay was that, as far as we could define, the whole thing was one mass of miliary tubercles. The coils of intestine were so firmly matted together that to attempt anything in the way of breaking up adhesions was out of the question. A small piece of tissue was removed by the scissors, and our gravest fears were afterwards substantiated by microscopic examination, when the pathological formation characteristic of tubercular deposit was discovered. The wound was closed according to surgical principles. There was not a ray of hope to enlighten our gloom - the hard facts had to be communicated to the parents, and antitubercular treatment suggested as the only resort, should she rally from her present condition. She made an uninterrupted recovery surgically, although her old pain gave considerable trouble for ~~a few~~ ^{ten} days after the operation, ^{and} it could only be relieved by ~~hypodermic~~ injections of morphia. Immediately the abdominal wound healed she was placed on open-air treatment and mercury administered by inunction all over the abdomen, and an ordinary binder tightly applied was constantly worn. After some time (about a month) the abdomen was gently rubbed, and this was gradually and cautiously increased in pressure until it became a gentle massage. This mode of administration was chosen with the view of promoting absorption more directly. After the first fortnight the pain entirely vanished - within the ninth/

ninth week the constipation was overcome, and the bowels were naturally acting, and the patient steadily continued to improve in every way. Open-air treatment, with mercury, was persisted in, and the same satisfactory progress was maintained for twelve months, when I took her photograph looking well and hearty. This was a few days before I left W.A. for the Homeland. One remarkable feature of the case may be noted - she lost but little flesh even when the pain was intensest, so that gain of weight did not constitute a prominent sign of her recovery, but the abdominal enlargement uniformly went down, and on examination twelve months after the operation I should say it was well-nigh normal. In short her progress was such that she never looked back after the first fortnight. On my departure I impressed on her the importance of adhering strictly to her treatment for at least six months longer. There was no sign of salivation, or any other adverse symptom contraindicating the use of mercury or necessitating its cessation even for a brief period. Opening the peritoneum has certainly an extraordinary effect on some cases of tubercular peritonitis, but, in this case, as I have already said, there was no peritoneal cavity to open, and I think mercury is justly entitled to a share in the honour of the wonderful results achieved.