SCIENCE

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THE SUPPRESSION OF CONSUMPTION.

THE first step in the practical suppression of consumption is to take those measures that are necessary to reduce its production to insignificant proportions; that is, we must secure the effective prevention of the disease. We shall attain this object by seeing that, on the one hand, we have or obtain such an amount of lung surface as is adequate not only to perform the ordinary work that is demanded of it, but also to meet, within certain limits, any extra demand that may be made upon it, and, on the other, by so arranging our habits, mode of life, and surroundings, that their tendency as a whole is to develop the lungs. What amount of lung capacity is necessary to conform to the above requirements? Hutchinson's so-called standard of vital capacity is too low. The lungs of a man having a chest-girth ranging between Brent's "medium" and "maximum" standards, with an extent of movement of four inches and upwards, would give the required amount of lung surface. I give these standards in the following table:—

Height. Ft. In.	Medium. Inches.	Maximum. Inches.
5 1	34.56	40.66
5 2	35.01	41.33
5 3	35.70	42.00
5 4	36.26	42.66
5 5	36.83	43.33
5 6	37.40	44.00
5 7	37.96	44.66
5 8	38.53	45.33
5 9	39.10	46.00
5 10	39.66	46.66
5 11	40.23	47.33
6 0	40.80	48.00

It will be found, on examination, that many of us do not possess the standard of chest development; and if we would be certain of absolute freedom from the possibility of an attack of the disease, then we should deliberately set to work to obtain this development. There is no difficulty whatever in doing that, for the size and shape of the chest depend upon the conditions to which it is subjected.[1] To develop the chest we must avoid those conditions that tend to disuse of the lungs, to their compression or injury, and introduce others that markedly tend to develop the lungs. If possible, the residence should be situated in the country, in a healthy suburb, or in a wide, open street. The rooms, and especially that used as the sleeping apartment, should be lofty, capacious, well lighted by windows that open, and ventilated by direct and continuous free communication with the external air, summer and winter, night and day. Gradually lower the temperature of the rooms till there is not nearly so much difference between it and that of the external air as that to which we are now accustomed. Great care should be taken about the clothing of the body. It is essential that the clothes should be made so loose that they offer no impediment to the full and free movement of the chest. When ordering clothes, be sure the measurement is taken at a full inspiration, and see that they are quite easy even then. Don't use braces, corsets, or respirators: they tend to impede the respiratory movement. Wool manufactured in such a way that it is elastic and permits free ventilation should be worn next the skin; and the under-linen should be frequently changed, so that no impediment is offered to its emanations. A sponge-bath should be taken every day. Low-heeled boots, wide, broad toes, should be worn, so that walking exercise may be taken in comfort. Spend as much time as possible, and that daily, in some form or other of active exercise in the open air. Carefully avoid the habit of stooping: throw the shoulders back, the chest forward, and get into the habit of holding the body erect at all times. Breathe through the nose, and take half a dozen deep inspirations, followed by full expiration, several times daily. Go in for gymnastics, giving special attention to the development of the muscles of the chest, swimming, singing, and athletics, and get gradually acclimatized to the external air, wind, and rain. Don't overload the body with clothes; and maintain the temperature in the natural way, by increased muscular exertion. Get the chest-girth and vital capacity taken at regular periods, and record them, so that you may know what progress you are making; and do not relax these efforts for a day until the chest-girth at the nipple line is higher than Brent's medium standard.

The members of consumptive families and those who bear the marks of threatened disease—a narrow chest and faulty carriage of the body, associated with some indication or other of deranged health—should make it the first business of their lives to carry out the above directions. Till that has been accomplished, it is worse than useless—it is certain disease—for them to engage in sedentary, chest-constricting, or dust-inhaling occupations. Those who are engaged in such occupations, or who are unavoidably submitted to surroundings that tend to reduce the breathing capacity, should most scrupulously devote sufficient time daily to one or other mode of developing the lungs, in order to counteract their effects. And I need not point out that considerations of self-interest, of humanity, and of public policy, alike de-

[1] "What is Consumption?" (1886); "The Experimental Production of Chest-Types in Man," British Association, 1887, Statistics; "Physical Development;" The Illustrated Medical News, Nov. 9, 1889.

mand that a practical effort should now be made to reduce the compression of the chest, the inhalations of small particles, and confinement, especially in rooms under ground, to a minimum in those trades.

At birth the child has a proportion of chest girth to height that slightly exceeds that of the maximum standard. I have suggested the birth standard as the true standard of health; but under the present system of bringing up children, they are, from the moment of birth right through the whole course of modern education, submitted to conditions that tend to reduce the breathing capacity; so that for a height of 51.84 inches there is a chest-girth of 26.10 inches, instead of one of 35.18 inches, or a loss, in about ten years, of nearly nine inches. And when there is consumption in the family, extra care is taken of the children; that is, these conditions are pushed to an extreme limit, and the so-called inherited consumption is the direct result. Here you have the best standard of chest-girth. Is it too much to ask that the conditions of the child's surroundings as a whole shall be so arranged that it may be retained? Look at the poor, puny chests we meet with, and at the reports of the registrar-general, and then we shall see the grave responsibility that lies upon us for producing such a change, and permitting it to continue.

I have pointed out the means by which we can develop the lungs to the required standard, and in so doing have shown how that development is to be retained, and consumption be effectually prevented. These measures are very simple; and in one form or other, and at some period or other within the twenty-four hours, they are within the reach of all. But they effect a complete change in our habits, mode of life, and surroundings; and a change of this nature must be slowly, gradually, and cautiously effected. I warn you against stretching the lungs (that is not development), against violent or sudden exertion and exhaustion. Uninterruptedly, step by step, acclimatize the bodies to the new conditions, and then they will lead us safely and surely to complete protection from consumption.

How can we reduce the mortality from consumption to insignificant proportions, and so complete the measures that are necessary to secure the practical suppression of the disease? This is the state with which we have to deal. The lungs are being progressively destroyed by a process of irritation[1] caused by more work being thrown on them than they are able to effect;[2] and this inability has been produced by their having been, and still being, subject to conditions that tend to reduce their capacity;[3] and, further, during the progress of these events, the other organs have become involved by attempting to perform compensatory work, with the result that the general health is more or less seriously compromised. Consequently, in order to adequately deal with this state of things, we must treat consumption upon the following principles: to establish an equilibrium between the amount of interchange required to be effected and that effected; to enable the other organs of the body to perform their ordinary functions; to restore to the lungs their power of adjustment to their external conditions; and to obtain the above without producing indications of friction: that is, in other words, we must arrest this process of irritation, restore the general health, and develop the lungs to the required amount, in ord to secure complete recovery from consumption. A litt consideration will make it evident, that, to carry out the first principle of treatment, we shall have to take measures from two distinct points of view. On the one hand, the conditions that impede the effecting of these interchanges must be, as far as that is possible, removed, and those that have an opposite tendency substituted; and, on the other, any deficiency that may remain must be made good by the compensatory action of one or more of the other organs. For this purpose we shall, in the first place, put the patient under conditions of habitation, habits, and surroundings that tend individually and collectively to promote these interchanges. The consumptive patient must be sent as soon as possible to live in a house the sanitary condition of which has been ascertained to be good, situated on an elevation, either in the country or at the seaside, where the air is pure and free from dust. Each room must communicate continuously and directly with the external air. Sunlight should be freely admitted; the windows constantly kept open, night and day; and the temperature, as recorded by a maximum and minimum thermometer, gradually lowered till there is not so great a difference between it and the external air as that we still find in the rooms of consumptive patients. The patient's clothes must be warm, not too heavy, and made so loose that they can offer no restraint to the free movement of the chest. Wool manufactured in such a way that it is elastic, permits free ventilation of the skin, and is not too heavy, should be worn next the body; that used during the day must not be worn at night, and the under-linen should be frequently changed. As much time as possible must be spent in the open air. If the patient is unable to walk, he should ride or drive in an open carriage till he has gained sufficient strength to enable him to do this. Sitting in a position that tends to impede the movement of the thorax must be carefully and constantly avoided, and the patient should be gradually induced to throw the weight of the shoulders on the spine till he both sits and walks with the body erect. If any deficiency remain,—and that, as well as its amount, will depend upon the extent of the disease,—we shall have to obtain compensation for it by measures that increase the activity of the functions of the skin, or the kidneys, or the alimentary canal. To increase the functional activity of the skin, we shall direct the patient to be bathed or sponged with warm water, medicated or not, as frequently as may be found desirable, once daily in any case; and, if necessary, we shall increase that activity by prescribing diaphoretics. If the action of the skin obtained by the above measures be not sufficient for the purpose, or if it be already performing its share of this compensatory work, then we shall increase the activity of the kidneys by suitable diuretics, and attend to the functions of the alimentary canal. Now, the above measures, thoroughly and carefully carried out, will, if the

[1] Tanner, Aitken, Wilson-Fox, Waldenburg, Schottelius, Roberts, Lombard, Marcet, Sanderson, Simon, Cohnheim, Frankel, Rindfleisch, Niemeyer, Powell, Ewart.

[2] Gautier, Peter, and the French School.

[3] Graham Balfour, Gintrac, Hanot (Jaccoud), Hutchinson, Fabino, Wintrich, Hecht, Schnievogt, Waldenburg, Ransome, Stokes, Frieund, Aitken.

disease be not too extensive, effect an equilibrium between the work required to be effected and the work effected, and we shall have obtained an arrest of the disease.

The first step towards enabling the other organs of the body to perform their ordinary functions has been already taken by removing that which was the primary cause of their derangement; viz., the presence in those organs of substances that interfered with their normal work, and altered, to a greater or less extent, the state of their nutrition and that of the body as a whole. We shall supplement that, where necessary, by appropriate means to secure the relief of any organ that may have become involved by its compensatory action, and to obtain the normal functional activity of the others, so that the body may be placed in a fit state for the reception and assimilation of suitable food. The nature and quantity of the food, and the time for its administration, must be carefully regulated according to the requirements of the case, but care must be taken not to give it too frequently or in too large quantities. I attach much importance to the careful cultivation of the appetite, so that the patient may be tempted to eat, and to the careful avoidance of any dish or article of food to which the patient has taken a dislike. Good new milk alone, or made up in various ways, cream, butter, olive-oil, marrow (I have found great benefit from a preparation of marrow and malt immediately after the meal), hot bacon with its fat, eggs, good beef-tea, soups, fish, fowl, cutlets, fillets, etc., with a suitable supply of vegetables and fruit, must be freely drawn upon for the patient's food. And we may add to this a good bitter beer, stout, or a good, sound claret, or wine, when we are sure we can get them.

No attempt whatever should be made to apply the third principle of treatment until the disease has been some time arrested, as shown by a progressive decrease of the symptoms of lung irritation, an increase in the area of breathing, increased vital capacity, extent of movement and girth, a nearly normal temperature, a steady improvement of the general health, and increased weight. Then the following measures may be gradually adopted and steadily increased, great care being taken to avoid either strain (the lungs must not be stretched) or over exertion, the state of the general functions and temperature being carefully watched. We place the patient under conditions that progressively make increasing demands for the use of the lungs, such as slight ascents on the neighboring hills, slowly performed at first, and then gradually increasing both the elevation and the time occupied in such exercise. Deep breathing is to be regularly practised, commencing with three or four full inspirations, followed by deep expirations, in succession, and increasing both their number and extent. I have found the careful and regular use of a spirometer very beneficial, and much regret that, as in the case of thermometers, no one as yet supplies them at such a price as will enable the general public to purchase them. Then the muscles of the chest must be fully developed, and the patient should take part in such exercises as will insure their full use. And this process of lung development will not be complete until the patient's vital capacity exceeds Hutchinson's so-called standard of health.

And we shall attain the object of the fourth principle of treatment by carefully selecting appropriate measures to effect each purpose we have in view (and the medicines must be prescribed precisely on the same principle; for instance, if we desire to increase the functions of the skin, a diaphoretic is prescribed, and its use stopped when we desire such action to cease), by using them at the right time and to the right extent, and by carefully watching their effects, so that if there be any indication of friction we may at once effect the necessary modification, or adopt some other means to attain the same object.

Under this system of treatment, the chest symptoms are immediately relieved; pain, cough, and expectoration speedily disappear; the area of breathing, the vital capacity, the chest-girth, and extent of movement, progressively increase. The temperature tends towards that of health, the general state improves, the weight increases, and there is a feeling of health and strength. In fact, so real is this, that it has been the source of one of the chief difficulties of treatment, by tempting the patient to do something beyond his strength, or to neglect some of the directions given him, till he finds himself promptly pulled up by a cessation of his improvement. Soon, in those cases in which the disease is not extensive, there is a complete arrest of the disease, no chest symptoms, a good state of the general health, a fair weight, normal temperature, a good breathing capacity, and eventually the patient makes a complete recovery. By this I mean he has the appearance and possession of sound health, natural breathing from base to apex, a well-formed and fully developed chest, and a good range of movement and vital capacity.

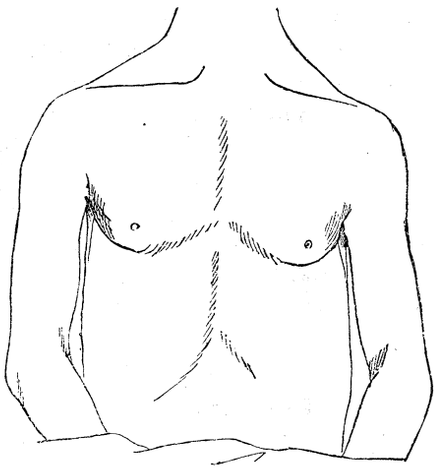
I have based this statement on the results I have invariably obtained in my experiments, and in the practical treatment of the cases of which the following notes appeared in the *Lancet* of Nov. 26, 1887, and Dec. 8, 1888, and in the *Illustrated Medical News* of Oct. 26, 1889:—

"CASE I.—In April, 1883, I saw H. O. M. E., a married lady, in conjunction with the gentleman who had attended her. We found the usual signs of phthisis of the right lung. Family history good; height 5 feet 2 inches; vital capacity 85 cubic inches. I accompanied the patient to Hastings, and saw that she was carefully treated on the principles I advocated in that paper.[1] June 13, much improved; vital capacity 130 cubic inches. June 21, improvement continues; now able to walk a mile or two; vital capacity 162 cubic inches. June 29, able to walk four miles; vital capacity 167 cubic inches. The patient was unfortunately obliged to return to town. The improvement stopped, and after a few weeks she began to lose ground. In September the patient went to the Isle of Wight, the vital capacity then being only 161½ cubic inches. Oct. 9, very much improved; vital capacity 195 cubic inches. She continued in the south, and was gradually accustomed to walk many miles daily; no chest symptoms. Nov. 4, patient's appearance that of a lady in good health; vital capacity 201½ cubic inches. Nov. 25, continues well; vital capacity 222½ cubic inches. Dec. 11, patient has recovered; angles of scapulæ lie flat on back,

[1] "The Scientific Treatment of Consumption," Manchester Meeting of the British Association.

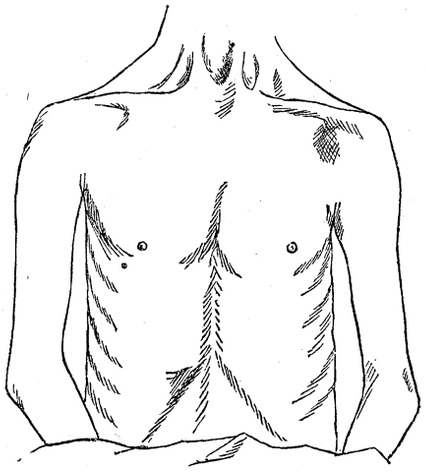
chest freely movable, and vital capacity 226 cubic inches, or 44 cubic inches above the so-called standard of health. Since that date the patient has had two children, there has been no relapse, and in September last her vital capacity was 220 cubic inches.

"Case II.—L. J. F. was said to have disease of the right lung by family doctor. The patient's father and uncles had died of consumption. I found the disease very limited, and the case a most favorable one to treat. Height 5 feet 6 inches; chest-girth at third rib 30 inches; extent of movement ½ inch; girth at ensiform cartilage 29 inches, extent of movement 1¼ inches. Treated on the same principles, the patient steadily and rapidly improved in condition. Two months later the chest-girth at the third rib was 32⅛ inches, extent of movement 1⅝ inches; girth at ensiform cartilage 30 inches, extent of movement 3 inches. Two months after the above, the patient had practically recovered. There was a further gain of half an inch in girth; no depression above or below clavicles; angles of scapulæ flat, and weight 9 stones 5 pounds. The patient continues well.



"Case III.—This was a servant, with disease of both lungs. The patient was sent home to the country apparently recovered, and desired no further attendance. I have since lost sight of her.

"Case IV. is that of myself. It will be fully understood that I only refer to it to complete the *prima facie* case I have established in support of this method of treating the disease. My mother, her three brothers, and two sisters died of phthisis. In physical appearance I was a well-marked example of the so-called 'inherited' disease. Height 5 feet 9½ inches; vital capacity considerably below the so-called standard; was always subject to winter cough; broke down while attending hospital in 1873, and was advised to leave at once, in the middle of the session. There was no doubt about the nature of the disease. Since that time I have gained about five inches in chest-girth, and for ten years have been free from any sign, symptom, or appearance of the disease.



"I shall be obliged if you will enable me to state that those patients continue well, notwithstanding the severity of last winter, and that their remarkable increase of chest-girth and range of expansion has been retained. Since then, I am sorry to say, I have only had an opportunity of applying those principles of treatment in two cases.

"The first case was an acute attack, temperature over 102°, in a case of long-standing and very extensive disease of both lungs. Under treatment, the temperature became nearly normal, cough and expectoration nearly disappeared, breathing became easy, the chest-girth increased, and in about six weeks the patient returned to work. A short time since, I heard that the patient was fairly well, and still able to continue at work; and, had there been a home placed under conditions suitable for treatment, I think this case would permanently recover, notwithstanding the extent of the disease.

"In the other case there was extensive disease of the right, with commencing disease of the left lung, and hectic. The patient could not leave his business, but carried out the directions so carefully that cough and hectic disappeared; the appetite was good, weight increased, and there was no difficulty in breathing on exertion. In fact, he felt and looked so well that he spent a day at Wimbledon, got thoroughly wet through in the camp, and remained in his wet clothes. That brought on an acute attack, and his temperature rose to over 103°. Under treatment, this was rapidly recovered from, and in three weeks he was fit to go, and went, to the Highlands. During the attack the patient lost eight pounds in weight; the heart was displaced to the right; and the chest-girth at ensiform cartilage was, on expiration 27½ inches, and on inspiration 28⅛ inches. The patient has no trouble with cough; the color is healthy; temperature nearly normal; weight has increased 12 pounds; heart has gone back; chest-girth at ensiform cartilage is, on expiration 28 inches, on inspiration 30½ inches; and there is no difficulty in breathing or cough when the patient runs."

"The cases previously reported continue well. Of the two cases which were noted in the *Lancet* of Dec. 1, 1888, one (Case 5), I understand, continues at work, and the other (Case 6) has had a most instructive record. This patient went through the winter very well, and I did not see him till the 29th of May, when, as the direct result of recent overwork in his business, I found he had materially lost ground, but unfortunately he could not leave town. A sharp attack of hæmoptysis came on on the 29th of June, and I was sent for. The temperature rapidly rose to 103°, but was promptly reduced, the hemorrhage arrested, and in a few days the patient was up. He left for the Highlands on the 19th of July, when his chest-girth was, on inspiration 30⅝ inches, and on expiration 30¼ inches, the extent of movement being only ⅜ of an inch. I next saw him on Oct. 3, his chest-girth being, on inspiration 32 inches, expiration 30 inches, showing an increase of 2 inches. This was associated with a considerable improvement in the local and

general state, weight 9 stones 4 pounds, and I am well satisfied with his progress.

"CASE VII.—On May 21 first saw this patient. Father and his brothers had died from consumption. Occupation dust-inhaling; liable to colds, slight cough, hectic, frequent diarrhœa, voice changed, and face pale; height 5 feet 5¼ inches; chest girth at ensiform cartilage, on inspiration 27½ inches, expiration 25 inches. Commencing disease of right lung. June 26, appetite fair; air entering more freely; chest-girth, on inspiration 28½ inches, expiration 26 inches. July 24, looks very well, sleeps well, appetite good, no cough, voice natural, temperature normal, air entering freely everywhere, good movement; chest-girth, on inspiration 29¾ inches, expiration 27 inches, showing an increase of 2¼ inches. The patient has practically recovered. Still well.

"CASE VIII.—Patient's mother's family consumptive. Dust-inhaling occupation. Has had cold upon cold, pale, appetite bad, fingers clubbed, pain over middle of third right rib, cough troublesome; temperature 99.1°. Disease of both lungs. Height 5 feet 9¼ inches; chest-girth, on inspiration 36¼ inches, expiration 33¼ inches. June 18, says he is first-class, looks better, appetite good; no cough, no pain in chest; air entering freely, more movement, apices higher; and chest-girth, on inspiration 37¾ inches, expiration 35 inches. July 17, sleeps well, eats well, and looks well. Temperature normal; weight 10 stones 9 pounds; no pain, no cough, no expectoration; air freely entering everywhere; and chest-girth, on inspiration 38 inches, expiration 34¾ inches, being an increase of 1¾ inches. Patient has nearly recovered, and returned to work. Continues well.

"CASE IX.—This patient has been getting thin, feels weak, pale, and appetite capricious. Occupation in a basement partly lighted by gas always. Commencing disease of left lung, breathing generally feeble, and very little movement. Temperature 96.6°; height 5 feet 8 inches; chest-girth, on inspiration 35 inches, expiration 32 inches. Aug. 29, says he feels quite well, and looks it; air entering freely everywhere, movement good; chest-girth, on inspiration 37¼ inches, expiration 32¼ inches, showing an increase of 2¼ inches; temperature normal; weight 10 stones 3 pounds. This patient is practically well. Still well.

"CASE X.—Patient has been losing weight for about twelve months, appetite very bad, cough very troublesome, hectic, perspiration at night; temperature 99.4°; height 5 feet 5 inches; chest-girth at ensiform cartilage, on inspiration 26½ inches, expiration 25¼ inches; very little movement, very little air entering; disease of both lungs. Sept. 18, has been to Hastings. Looks well, sleeps well, cough only occasional when exposed to cold, appetite wonderfully good, voice greatly improved, air entering freely, fair general movement; chest-girth, on inspiration 29½ inches, expiration 26¾ inches, showing an increase of 3 inches. Making splendid progress.

"CASE XI.—Saw this patient on the 10th of July. Disease of both lungs. Temperature 99°; expectoration colored, cough very troublesome, had been losing weight; chest-girth, on inspiration 26 inches, expiration 24¾ inches. Sent to Hastings. Sept. 29, looks very much better, little cough, appetite good, steadily putting on flesh, air freely entering, movement good; and chest-girth, on inspiration 28¼ inches, expiration 25¼ inches, being an increase of 2¼ inches. This patient is making most satisfactory progress.

"CASE XII.—Patient has extensive disease of both lungs. Hæmoptysis six years ago, and from time to time up to date. Has tried Madeira, Torquay, etc. Height 5 feet 7⅝ inches; chest-girth, on inspiration 25 inches, expiration 25¼ inches. Sept. 27, decidedly better, breathing much easier, more air entering generally, moist sounds clearing up; chest-girth, on inspiration 27½ inches, expiration 26⅝ inches, showing an increase of 2¼ inches. Going to Hastings. There is a little hope for this patient."

Further, the literature of consumption supplies us with a mass of evidence that clearly and unquestionably points to the accuracy of the above results. In the first place, an examination of the circumstances in which the numerous recorded cases of arrest, whether for a longer or shorter period, have taken place, shows that conditions that tend to obtain compensatory action by one or more of the other organs, those that tend to develop the lungs, or both associated together, were always present. Formerly arrests were sometimes obtained by the induction of an artificial skin-disease, by the use of counter-irritants, by bathing and sponging, and by preparations acting on the skin, kidneys, and digestive tract. Patients sent to hilly districts in the country, to the seaside, to warmer climates, where more time was spent out of doors, or to the mountains, have obtained an arrest of the disease, and similar results have followed the taking-up of the trade of testing wind-instruments or practising various methods of inhalation.[1]

Not only have such conditions been invariably present where a temporary arrest has been effected, but they also, and especially those that tend to develop the lungs, have always been for a long time present in all the cases in which a complete cure has been obtained.[2] We know that men have completely recovered after following an occupation in the open air for many years, after long residence in mountainous districts, after many years spent in constant travelling, and after leading an active life on the borders of civilization in all parts of the world. Such are the thousands of happy results that have been so correctly described by Walshe as "Nature's cures." But there was a physician who could, and did, cure consumption by a definite method of treatment, as distinguished from the accidental nature of the recoveries above referred to, and that was Sydenham. He ordered his patients to continuously ride on horseback till they got well. This exercise was to be taken in the country, where the air was good; the riding was to be increased from seven to one hundred and fifty miles a day; and the patients were only to stop for food for themselves and horses, and not to remain more than one night in a place. And of this method of treatment he said, "I have put very many upon this exercise, and I can truly say I have missed the cure of very few."

[1] Ruehle (Ziemssen), Meckel, Powell, Ewart, Hanot (Jaccoud), Hirtz, Magnus Huss, Blake, Roger and Boudet, Heitler, Laennec, Cotton, Clark.

[2] Frieund, Case in Royal Infirmary, Edinburgh (Lauder-Brunton), Cruveilhier, De Mussy, Fuentes, Harrhy, Stokes, Ewart, Herman-Weber, Andrew, Austin Flint, Fuller, MacCormac, Germain Sée, Hastings, etc.

We are now in a position to state the case that has been laid before us. We have seen that the accepted theories of consumption must be rejected, because they either have no foundation in fact, or they do not accord with and are incapable of affording an adequate explanation of all the known facts of the case; and that Koch's theory falls within these categories. A new theory—that consumption is the direct result of the reduction of the breathing surface of the lungs below a certain point in proportion to the remainder of the body, and is solely produced by conditions that tend to reduce the breathing capacity—has been brought before us, and the following evidence adduced in its support:—

1. Consumption has been experimentally produced by conditions that tend to reduce the breathing capacity. Koch's successful experiments were directly produced by those conditions.

2. We can at any time watch the direct production of consumption by these conditions in the dust-inhaling trades.

3. The trades and occupations that directly compress the thorax, or impede the respiratory functions, are notorious for their production of consumption.

4. A large amount of consumption is produced in the army every year by those conditions.

5. Consumption has been repeatedly produced by confinement, both in man and in animals.

6. The children of consumptive parents who become diseased have been carefully brought up under such conditions.

7. Consumption bears the mark of the effects of the progressive action of such conditions from its commencement to its termination.

8. There is no recorded case of consumption, experimental or not, in which those conditions were absent.

9. Where such conditions are absent, there is no consumption in man or animal.

10. Upon their introduction, consumption immediately appears, both among men and in animals.

11. The disease presents a perfectly natural series of events when viewed in this light.

12. Its presence in our midst is due to the changes in our habits, mode of life and surroundings, that are being effected by the progressive advances of civilization.

13. Consumption has been prevented by the removal or counteraction of those conditions. The immunity of mountaineers is due to their capacious lungs.

14. The disease has been frequently arrested for a longer or shorter period by the accidental or deliberate adoption of measures that tended to compensate for or counteract those conditions.

15. And both the experimental and the practical application of measures that tend to compensate for and counteract those conditions have invariably been followed by the arrest and subsequent complete recovery from consumption, where the disease was not too extensive; and the same process has obtained in the thousands of cases of cure by nature and by Sydenham. Therefore this theory is founded on fact, and is both in strict accord with and capable of affording an adequate explanation of all the known facts of the case. And consequently we now have it in our power to secure, with absolute certainty, the prevention of and recovery from consumption. I have laid down the principles that must guide us in carrying out this work, and now it only remains for me to point out the directions in which we must move, in order to secure the general application of this knowledge, and the consequent practical suppression of consumption. The State loses the services of a large number of men every year from consumption in the army and in the various departments of the civil service. That not only represents a considerable financial loss, but in the case of the army it also constitutes a serious source of danger to the State. The trades and occupations that produce so much consumption should be the subject of careful inquiry to ascertain how this production can be reduced to a minimum. That this inquiry is urgently called for, is evident from the following statistics, taken from the supplement to the "Registrar-General's Report," which show, that, out of a thousand deaths among various classes, there were from phthisis,[1] among Cornish miners, 690; earthenware-manufacturers, 473; printers, 461; file-makers, 433; cutlers, etc., 371; brewers, etc., 334; stone-quarriers, etc., 308; drapers, etc., 301; publicans, etc., 295; tailors, 285; cotton-manufacturers, etc., 272; wool-manufacturers, 257; shoemakers, 254; builders, etc , 252; carpenters, etc., 204; hosiery-manufacturers, 168; laborers (agriculture), 122; gardeners, 121; fishermen, 108; farmers, etc., 103

Physical education should be made a necessary part of our system of national education. We look to the government for action in the above directions, and their serious and immediate attention should be given to them. Life-assurance companies and sick-benefit societies can co-operate most materially in the prevention of consumption, and save their members considerable sums of money annually by insisting upon their members having or obtaining the required amount of lung development. And every available opportunity should be taken of placing before workingmen's clubs and societies the immense importance of physical development.

It is of great importance that the consumptive patient should be placed under treatment as soon as possible, and that it be uninterruptedly continued until the recovery is complete. For this purpose we require hospitals and institutions placed in the most favorable conditions in the country and at the seaside, and I am sure the means will be gladly found for opening these institutions when once their necessity and immense importance have been realized. With such institutions, so placed, and this system of treatment thoroughly and continuously carried out, I am certain we shall have reduced the mortality from consumption to truly insignificant proportions before the next century has escaped from its infancy. And I have the right to express a clear and emphatic opinion on this subject; for I myself and my patients have unquestionably completely recovered from the disease. A great, a splendid, a noble victory over this disease lies in the hands of the profession. Shall we let doubt stand between us and its practical achievement?

G. W. Hambleton.

[1] The disease is very rare among gypsies.