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WEAK LUNGS, AND HOW TO MAKE THEM STRONG.

THE highest medical authorities of this century have expressed the opinion that tubercular disease of the various tissues is justly chargeable with one-third of the deaths among the youth and adults of the civilized world. The seat of this tubercular disease is, in great part, in the lungs.

Before the taint is localized, it is comparatively easy to remove it. If in regard to most other maladies it may be said that "an ounce of prevention is worth a pound of cure," in reference to tubercular consumption it may be truly declared that an ounce of prevention is worth tons of cure.

Had the talent and time which have been given to the treatment of consumption been bestowed upon its causes and prevention, the percentage of mortality from this dreaded disease would have been greatly reduced.

NATURE OF CONSUMPTION.

GENUINE consumption does not originate in a cold, an inflammation, or a hemorrhage, but in tubercles. And these tubercles are only secondary causes. The primary cause is a certain morbid condition of the organism, known as the tubercular or scrofulous diathesis. This morbid condition of the general system is sometimes hereditary, but much more frequently the result of unphysiological habits. Those cases to which our own errors give rise may be prevented, and a large proportion of those who have inherited consumptive taint may by wise hygiene be saved.

Consumption is not a Local Disease.—It is thought to be a malady of the lungs. This notion has led to most of the mistakes in its treatment.

Salt rheum appears on the hand. Some ignorant physician says, "It is a disease of the skin." An ointment is applied; the eruption disappears. Soon, perchance, the same scrofulous taint appears in the lungs in the form of tubercles. The doctor cannot get at it there with his ointment, and resorts to inhalation. He is still determined to apply his drug to the local manifestation.

Salt rheum is not a disease of the skin. It is a disease of the system, showing it-

self at the skin. Consumption is not a disease of the lungs. It is a disease of the system, showing itself in the lungs.

A ship's crew is seized with some fearful malady. They hang out a flag of distress. Another ship passes near the infected vessel. Its captain discovers the flag of distress. A boat's crew is sent to cut it down. The captain turns to his passengers with the triumphant exclamation, "We have saved them! All signs of distress have disappeared!"

A human body is diseased in every part. A flag of distress is hung out in the form of some malady at the surface. Some physician whose thinking is on the surface of things applies an ointment, which compels the malady to go back within the body again. Then he cries, "I have cured him; see, it is all gone!"

It may be said, that, when the disease attacks the lungs, it must be driven from that vital organ at any sacrifice. I reply, if the drug vapors which are inhaled could disperse the tuberculous deposit, — which is impossible, — the tubercle could not be transferred to any other internal organ where it would do less harm. No other internal organ can bear tuberculous deposit or ulceration with less danger to life.

In 1847, two brothers, bank-officers, afflicted with chronic inflammation of the eyes, came under my care. I repeatedly prescribed for them, but their eyes got no better. Indeed, they had little hope of relief; for, during their years of suffering, many physicians had treated them without avail. At length I told them there was no hope but in absence from their business, and such recreation as would elevate the general tone. A few months of hunting, fishing, and enjoyment in the country sufficed to remove the redness and weakness from their eyes. As I have argued, the disease was not one of the eyes, but of the entire system, which had assumed a local expression.

This dependence of particular upon general disease is a common idea with the people. A young man begins business with a large capital. He falls into dissipation. In ten years it exhausts his fortune. When at last we see him begging for bread, we do not say this exhibition of his poverty is his financial disease. His financial *constitution* has been ruined. The begging is only an unpleasant exhibition of that ruin. During this course of dissipation, the young man, in addition to the exhaustion of his fortune, ruins his health. His lungs fall into consumption. Some doctor may tell you it is disease of the lungs. But it is no more disease of the lungs than was begging the man's financial malady. In either case, the apparent disease is only an exhibition of the constitutional malady.

In brief, a local disease is an impossibility. Every disease must be systemic before it can assume any local expression. Or, in other words, every local pathological manifestation is an expression of systemic pathological conditions.

Now what is the practical value of this argument? I reply: So long as people believe bronchitis to be a disease of the throat, or consumption a disease of the lungs, so long will they labor under the hallucination that a cure is to be found in applications to these parts. But when they are convinced that these diseases are local expressions of morbid conditions pervading the whole organism, then whatever will invigorate their general health, as Nature's hygienic agents, will receive their constant and earnest attention.

CAUSES OF CONSUMPTION.

Sir James Clarke says, — "It may be fairly questioned whether the proportion of cures of confirmed consumption is greater at the present day than in the time of Hippocrates: and although the public may continue to be the dupes of boasting charlatans, I am persuaded that no essential progress has been made or *can be made* in the cure of consumption, until the disease has been treated upon different principles from what it hitherto has been. If the labor and ingenuity which have been misapplied in fruitless

efforts to cure an irremediable condition of the lungs had been rightly directed to the investigation of the causes and nature of tuberculous disease, the subject of our inquiry would have been regarded in a very different light from that in which it is at the present period."

While I shall not attempt a discussion of all the causes of *phthisis pulmonalis*, I shall, in a brief and familiar way, consider the more obvious sources of this terrible malady, and particularly those which all classes may remove or avoid.

Impure Air a Cause of Consumption. — In discussing the causes of a disease whose principal expression is in the lungs, nothing can be more legitimate than a consideration of the air we breathe. In full respiration, it penetrates every one of the many millions of air-cells.

Dust. — Every species of dust must prove injurious. Workers in those factories where tools are ground and polished soon die of pulmonary disease. The dust of cotton and woollen factories, that of the street, and that which is constantly rising from our carpets, are all mischievous. M. Benoiston found among cotton-spinners the annual mortality from consumption to be 18 in a thousand; among coal-men, 41; among those breathing an atmosphere charged with mineral dust, 30, and with dust from animal matter, as hair, wool, bristles, feathers, 54 per thousand: of these last the greatest mortality was among workers in feathers; least among workers in wool. The average liability to consumption among persons breathing the kinds of dust named was 24 per thousand, or 2.40 per cent. In a community where many flints were made, there was great mortality from consumption, the average length of life being only 19 years.

Gases. — Among the poisonous gases which infest our atmosphere, carbonic acid deserves special consideration. The principal result of all respiration and combustion, it exists in minute quantities everywhere, but when it accumulates to the extent of one or two per cent. it seriously compromises health. I have seen the last half of an eloquent sermon entirely lost upon the congregation; carbonic acid had so accumulated that it operated like a moderate dose of opium. No peroration would arouse them. Nothing but open windows could start life's currents. In lectures before lyceums, I often have a quarrel with the managers about ventilation. There is, even among the more intelligent, a strange indifference to the subject.

The following fact graphically illustrates the influence of carbonic acid on human life.

A young Frenchman, M. Deal, finding his hopes of cutting a figure in the world rather dubious, resolved to commit suicide; but that he might not leave the world without producing a sensation and flourishing in the newspapers, he resolved to kill himself with carbonic acid. So, shutting himself up in a close room, he succeeded in his purpose, leaving to the world the following account, which was found near his dead body the next morning.

"I have thought it useful, in the interest of science, to make known the effects of charcoal upon man. I place a lamp, a candle, and a watch on my table, and commence the ceremony.

"It is a quarter past ten. I have just lighted the stove; the charcoal burns feebly.

"Twenty minutes past ten. The pulse is calm, and beats at its usual rate.

"Thirty minutes past ten. A thick vapor gradually fills the room; the candle is nearly extinguished; I begin to feel a violent headache; my eyes fill with tears; I feel a general sense of discomfort; the pulse is agitated.

"Forty minutes past ten. My candle has gone out; the lamp still burns; the veins at my temple throb as if they would burst; I feel very sleepy; I suffer horribly in the stomach; my pulse is at eighty.

"Fifty minutes past ten. I am almost stifled; strange ideas assail me. . . . . I can scarcely breathe. . . . . I shall not go far. . . . . There are symptoms of madness. . . . .

"Eleven o'clock. I can scarcely write. . . . . My sight is troubled. . . . . My lamp is going out. . . . . I did not think it would be such agony to die. . . . . Ten . . . . . "

Here followed some quite illegible characters. Life had ebbed. The following morning he was found on the floor.

The steamer Londonderry left Liverpool for Sligo, on Friday, December 2d, 1848, with two hundred passengers, mostly emigrants. A storm soon came on. The captain ordered the passengers into the steerage cabin, which was eighteen feet long, eleven wide, and seven high. The hatches were closed, and a tarpaulin fastened over this only entrance to the cabin.

The poor creatures were now condemned to breathe the same air over and over again. Then followed a dreadful scene. The groans of the dying, the curses and shrieks of those not yet in the agonies of death, must have been inconceivably horrible. The struggling mass at length burst open the hatches, and the mate was called to gaze at the fearful spectacle. Seventy-two were already dead, many were dying, their bodies convulsed, the blood starting from their nostrils, eyes, and ears.

It does not appear that the captain designed to suffocate his passengers, but that he was simply ignorant of the fact that air which has passed to and fro in the lungs becomes a deadly poison.

The victims of the Black Hole in Calcutta and of the Steamer Londonderry, with the thousand other instances in which immediate death has resulted from carbonic acid, are terrible examples in the history of human suffering; but these cases are all as nothing, compared with those of the millions who nightly sleep in unventilated rooms, from which they escape with life, but not without serious injury. As a medical man, I have visited thousands of sick persons, and have not found one hundred of them in a pure atmosphere. I have often returned from church seriously doubting whether I had not committed a sin in exposing myself to its poisonous air. There are in our great cities churches costing fifty thousand dollars, in the construction of which not fifty dollars were expended in providing means for ventilation. Ten thousand dollars for ornament, but not ten dollars for pure air! Parlors with furnace-heat and a number of gas-burners (each of which consumes as much oxygen as several men) are made as close as possible, and a party of ladies and gentlemen spend half the night in them. In 1861 I visited a legislative hall. The legislature was in session. I remained half an hour in the most impure air I ever attempted to breathe. If the laws which emanated from such an atmosphere were good, it is a remarkable instance of the mental and moral rising above a depraved physical. Our school-houses are, some of them, so vile in this respect that I would prefer to have my son remain in utter ignorance of books, rather than breathe, during six hours of every day, so poisonous an atmosphere. Theatres and concert-rooms are so foul that only reckless people can continue to visit them. Twelve hours in a railway-car exhausts one, not because of the sitting, but because of the devitalized air. While crossing the ocean in the Cunard steamer Africa, and again in the Collins steamer Baltic, I was constantly amazed that men who knew enough to construct such noble ships did not know enough to furnish air to the passengers. The distresses of sea-sickness are greatly intensified by the sickening atmosphere which pervades the ship. Were carbonic acid black, what a contrast would be presented between the air of our hotels and their elaborate ornamentation!

It is hardly necessary to say that every place I have mentioned might be cheaply and completely ventilated.

Consumption originates in the tubercular diathesis. This diathesis is produced by those agencies which deprave the blood and waste vitality. Of these agencies none is so universal and potent as impure air. When we consider, that, besides mingling momentarily with the

blood of the entire system, it is in direct and constant contact with every part of the lungs, we cannot fail to infer that foul air must play a most important part in that local expression of the tubercular taint known as pulmonary consumption.

The author of an excellent work on consumption declares, —

"Wholesome air is equally essential with wholesome food; hence it is that crowding individuals together in close, ill-ventilated apartments, as is often the case in boarding-schools, manufactories, and work-houses, is extremely prejudicial, both as a predisposing and exciting cause of tubercular disease."

The great Baudeloque considers impure air the only real cause of scrofula, other causes assisting. He thinks that no scrofula could be developed without this cause, whatever others might be in operation.

An English writer who was physician to the Princess Victoria says, — "There can be no doubt that the confined air of gloomy alleys, manufactories, work-houses, and schools, and of our nurseries and very sitting-rooms, is a powerful means of augmenting the hereditary predisposition to scrofula, and of inducing such a disposition *de novo*."

To drink from the same tumbler, to eat from the same plate, to wear the same under-clothes, to wash in the same water, even with the cleanest of friends, would offend most people. But these are as alabaster whiteness and absolute purity, compared with the common practice of crowding into unventilated rooms, and thus sucking into the innermost parts of our vital organs the foulest secretions from each other's skins and lungs. I wish it were possible for these vile exhalations to be imbued with some dark color, if but temporarily. Then decency would join with reason in demanding a pure atmosphere.

NIGHT AIR.

CONSUMPTIVES, and all invalids, and indeed persons in health, are cautioned to avoid the night air. Do those who offer this advice forget that there is no other air at night but "night air"? Certainly we cannot breathe day air during the night. Do they mean that we should shut ourselves up in air-tight rooms, and breathe over and over again, through half the twenty-four hours, the atmosphere we have already poisoned? We have only the choice between night air pure and night air poisoned with the exhalations from our skins and lungs, perhaps from lungs already diseased. A writer pertinently speaks on this point after the following fashion: —

"Man acts strangely. Although a current of fresh air is the very life of his lungs, he seems indefatigable in the exercise of his inventive powers to deprive himself of this heavenly blessing. Thus, he carefully closes his bed-chamber against its entrance, and prefers that his lungs should receive the mixed effluvia from his cellar and larder, and from a patent little modern aquarius, in lieu of it. Why should man be so terrified at the admission of night air into any of his apartments? It is Nature's ever-flowing current, and never carries the destroying angel with it. See how soundly the delicate little wren and tender robin sleep under its full and immediate influence, and how fresh and vigorous and joyous they rise amid the surrounding dew-drops of the morning. Although exposed all night long to the heaven, their lungs are never out of order; and this we know by daily repetition of the song. Look at the new-born hare, without any nest to go to. It lives and thrives and becomes strong and playful under the unmitigated inclemency of the falling dews of night. I have a turkey full eight years old that has not passed a single night in shelter. He roosts in a cherry-tree, and is in primest health the year through. Three fowls, preferring this to the warm perches in the hen-house, took up their quarters with him early in October, and have never gone to any other roosting-place. The cow and the horse sleep safely on the ground, and the roebuck lies down

to rest on the dewy mountain-top. I myself can sleep all night long, bareheaded, under the full moon's watery beams, without any fear of danger, and pass the day in wet shoes without catching cold. Coughs and colds are generally caught in the transition from an over-heated room to a cold apartment; but there would be no danger in this movement, if ventilation were properly attended to, — a precaution little thought of nowadays."

Dr. James Blake advises the consumptive to join with several friends, procure horses and wagons, and set off upon a long journey, sleeping in the open air, no matter what the weather. He seems to think this the only way in which it is possible to induce the consumptive to sleep in the fresh air. Doctor Jackson gives the case of a consumptive young man (he does not state the condition of his lungs) who was cured by sleeping in the open air on a hay-stack. This advice and experience do not quite harmonize with the common terror of night air.

But while I believe that breathing the pure out-door air all night is an important curative means in this disease, I do not believe that sleeping in the open fields of a stormy night is the *best means* for securing pure night air, in the case of a feeble woman; on the contrary, I think it might be more pleasantly, and quite as effectually, secured in a comfortable house, with open windows and an open fire.

No doubt the lives of thousands would be saved by destroying their houses, and compelling them to sleep in the open air; — not because houses are inevitable evils, but because they are so badly used. Windows are barred and closed, as if to keep out assassins; draughts defended against, as if they were bomb-shells; and the furnace heat still more corrupts the air, which has done duty already — to how many lungs, for how many hours?

Let the consumptive thank God for the blessing of a house, but let him use it wisely. How my heart has ached, to see the consumptive patient put away in a bed, behind curtains, in an unventilated room, the doors and windows carefully closed, to shut out the very food for which his lungs and system were famishing!

I do not wonder that Blake, Jackson, and many others have advised an out-door life of the wildest and most exposed sort, to invalids of this class, — but I do wonder that they have not equally insisted upon abundance of air for them, as pure as that of the fields and mountains, in their own homes, and in the midst of friends and comforts.

MOISTURE IN THE ATMOSPHERE.

It is the common belief that a dry atmosphere is most favorable to the consumptive. Many medical authors have advanced this assumption. It is, nevertheless, an error. In the British Isles and in France, outside the cities and manufactories, the mortality from pulmonary diseases is much less than among the agricultural classes of this country. And on the western shores of this continent consumption is comparatively unknown.

Our disadvantage in this comparison is attributable, in considerable part, to the lack of humidity in our atmosphere. Without the evidence of facts, we might, *a priori*, argue, that excessive dryness of the air would produce dryness and irritability of the air-passages. From time immemorial, watery vapor has been used as a remedy in irritation and inflammation of the respiratory organs.

A hundred times have my consumptive patients expressed surprise that the wet weather, in which I have insisted they should go out as usual, has not injured them, — that they even breathe more freely than on pleasant days. Of course, I tell them, if the body is well protected, the more moist the air, the more grateful to your lungs.

There is no possible weather which can excuse the consumptive for keeping in-doors. Give him sufficient clothing, protect his feet carefully, and he may go out freely in rain, sleet, snow, and wind.

Ignorance of this fact has killed thousands.

That point of temperature at which the moisture of the air first becomes visible is known as the dew-point. According to one authority, the mean dew-point of England, from the first of November to the last of March, is about 35°; that of our Northern States about 16°. Now suppose a house in England is kept at a temperature of 70°, the drying power would there be represented by 35. A house with the same temperature in Albany, for example, would possess a drying power of 54. This great contrast in the atmosphere of the two countries is strikingly illustrated by the difference between the plump body and smooth skin of the Englishman, and the lean, juiceless body, and dry, cracked skin of the Yankee. It is also shown by the well-known difference in the influence of house-heat upon furniture. Our chairs and sofas and wood-work warp and shrink, while nothing of the sort occurs in England.

As we cannot increase the amount of moisture in the atmosphere of our continent, we must limit our practical efforts to the air of our houses. If we use a stove, its entire upper surface may be made a reservoir for water; ornamental work, of but little cost, may be used to conceal it. The furnace may be made to send up, with its heat, many gallons of water daily, in the form of vapor. In justice to stoves and furnaces, I must say here, that, in the opportunity to do this, they possess one advantage over open fire-places.

By adding artificial moisture in this way to the air of our houses, we not only save our furniture from drying and shrinking, but protect our skin, eyes, nose, throat, and lungs from undue dryness, and from the affections to which it would give rise. It is found necessary, in our cloth-manufactories, to maintain a moist atmosphere in order to successful spinning. Intelligent managers have assured me that coughs and throat difficulties are comparatively rare in the spinning department.

We must all have observed, that, while the air of a hot kitchen is comfortable, that of a parlor at the same heat, from an air-tight stove, is almost suffocating. The kitchen has a hot stove, but the steam of its boiling kettles moistens the air.

Your country aunt, who has lived over her cooking-stove for years without serious inconvenience, after spending an afternoon in your parlor, heated by a stove or furnace, returns home "glad to get out of that hot, stifling air." And yet the thermometer may have indicated that the kitchen was ten degrees warmer than the parlor. The dry heat of the parlor produced headache, irritability, and perhaps a sense of stricture in the chest. If we would avoid these, a dry chapped skin, an irritable nervous system, and a dry hacking cough, we must add the needed humidity by artificial means.

CLIMATE.

The influence of climate in the production of tuberculosis was formerly much exaggerated. Removal to a warm latitude, so generally prescribed some years ago, is now rarely advised. Although the bland atmosphere and out-of-door life of the tropics may often check the progress of the malady, yet the constitution is generally so enervated that the return to home and friends involves often not only a return of the malady, but its more rapid progress. At present, a winter at Lake Superior, or other region where the cold is intense and uniform, is the popular prescription. I do not doubt the value of the expedient in many cases. But the consumptive who can afford a winter neither in the Mediterranean nor at the frigid North may comfort himself that the value of such trips has been greatly overrated. Advice to the phthisical to spend a season a thousand miles from home is, to a large majority of them, not unlike that of the whimsical London doctor to the rag-picker he found coughing in the streets: — "That 's a bad cough, a bad

cough, you have. I advise you to make a journey on the Continent; and, in order to secure all the advantages, you had better travel in your own carriage." Happily for those with short purses, health in this, as in most other cases, is more easily found at home.

I do not believe that the prejudice against our New-England climate, entertained by consumptives, is well-founded. The slight percentage of difference against us, as compared with the people of other parts of the country, in the number of deaths from consumption, is to be traced, I believe, not so much to our climate as to our manufactories. New England contains nearly all the great factories, labor in which is so prejudicial to health, — as well as a greater number of furnaces, air-tight stoves, and close houses.

I do not believe that the sudden changes of the New-England climate are disastrous to the consumptive who is well protected. While it is true that our climate provokes a greater number of colds than that of Florida, it is not less true that our atmosphere is more invigorating.

"The Climate of the United States," by Dr. Samuel Forry, of the United States Army, one of the best works of the kind ever published, gives a great number of facts, interesting in this connection. His statistics are gathered exclusively from the army. The men of the army are, in great part, of the same age, from the same rank in life, of the same habits, and have the same clothing, food, and labor, and when sick the same treatment. The influence of climate upon human health may, therefore, be ascertained with more accuracy from careful observations among this class of men than from any other source. In comparing the populations of New York and New Orleans, for instance, it is almost impossible to make accurate allowance for the manifold differences in habits, diet, occupation, etc.

Dr. Forry shows conclusively, that, while colds and influenzas are more common in the northern branches of the regular army, as 552 to 271, consumption is more common in the southern, in the proportion of $10\frac{1}{2}$ to $7\frac{3}{8}$. In the southern divisions there are 708 cases of fever of various sorts to 192 in the northern. "We may safely infer," he says, "that whatever tends to impair the constitution, as fevers, tends to develop consumption in every class which is predisposed, and in all climates and countries." Dr. Forry's tables present some curious facts. One which will most impress the general reader is, that rheumatism is more common at Key West than on the coast of New England. But it will not surprise the reflecting, that a change of 5° at Key West is felt as much as one of 20° at Boston. The slight changes, however, do not equally purify the atmosphere and invigorate the body.

DRESS.

No subject is so intimately connected with the health of the respiratory apparatus as dress. And, as bearing upon pulmonary consumption, there are certain errors in the dress of children which must be noticed. I believe I echo the voice of my profession, when I declare that the seeds of consumption are planted in thousands by these mistakes in dress during infancy and childhood. To correct these, permit me a few practical suggestions.

The skirt-bands must be left very loose. If you would give the baby's lungs and heart the best chance for development, the dress about the chest and waist should be so loose, that, if the child be held up by the shoulders, its entire dress, except as sustained by the shoulders, will fall to the floor. With such a dress the blood is so much sooner oxygenated, that, other things being equal, the characteristic dark red color of the skin will disappear much sooner than with a close dress.

The bones surrounding the small, feeble lungs, now for the first time beginning to move, are so soft and pliable, that, under the slightest pressure, they will yield, and the capacity of the lungs be reduced. Yet I have seen the nurse

use the entire strength of her fingers in the first application of the skirt-bands. No thoughtful person, acquainted with the anatomy of the thorax in a new-born babe, can escape the conclusion that its vitality is seriously compromised by this pressure upon the principal organs of that vitality. In many instances I have seen the character of the little one's respiration and pulse decidedly affected by enlarging the skirt-bands.

Mothers, if you think all this pressure necessary to give your babes a form, as I have heard some of you say, you forget that the Creator of your child has all wisdom and skill, and that any changes in the baby's form and proportions must prove only mischievous. And perhaps you may not feel your pride hurt by the suggestion, that His taste is quite equal to yours. That a corset or other machine is needed to give a human being a form, as is so often suggested, is an imputation on the Creator which no thoughtful and conscientious person can indulge.

Dress of Children's Arms. — Prominent among the errors in the dress of children is the custom of leaving their arms nude.

I speak of the dress for the damp and cold seasons. It should be added, that during the cool summer evenings too much care cannot be exercised in protecting the baby's arms and shoulders. If the mother desires to exhibit her darling's beautiful skin, let her cut out a bit of the dress near its heart, and when the neighbors come in, let her show the skin thus exposed to the company. This is so near the central furnace of the body that it has no chance to get cold; but in the case of the arms and legs, we have parts far removed from the furnace, and such parts require special protection.

Take the glass tube of the thermometer out of the frame, and put the bulb in your baby's mouth. The mercury rises to 98°. Now, on a cool evening, place the same bulb in its little hand; (I am supposing it has naked arms;) the mercury will sink to 60° or less. Need I say that all the blood which has to make its way through the diminutive and tortuous vessels of those cold arms must become nearly as cold as the arms and hands themselves? And need I add, that, as the cold currents of blood come from both arms back into the vital organs, they play the mischief there?

If you would preserve your child from croup, pneumonia, and a score of other grave affections, you should keep its arms warm. Thick woollen sleeves, fitting the little dimpled arms down to the hands, at least, constitute the true covering.

A distinguished physician of Paris declared just before his death, — "I believe that during the twenty-six years that I have practised my profession in this city, twenty thousand children have been borne to the cemeteries, a sacrifice to the absurd custom of naked arms."

When in Harvard College, many years ago, I heard the eminent Dr. Warren say, — "Boston sacrifices hundreds of babes every year by not clothing their arms."

What has been said of the dress of children is none the less applicable to the dress of adults. One of the gravest mistakes in the dress of women is the very thin covering of their arms and legs. A young lady once asked me what she could do for her very thin arms. She said she was ashamed of them. I felt of them through the thin lace covering, and found them freezing cold. I asked her what she supposed would make muscles grow? Exercise, she replied. Certainly, — but exercise makes them grow only by giving them more blood. Six months of vigorous exercise will do less to give those cold, naked arms circulation than would a single month, were they warmly clad.

The value of exercise depends upon the temperature of the muscles. A cold gymnasium is unprofitable. Its temperature should be between sixty and seventy, or the limbs should be warmly clothed. I know our servant-girls and blacksmiths, by constant and vigorous exercise, acquire large, fine arms, in spite

of their nakedness; and if our young ladies will labor as hard from morning till night as do these useful classes, they may have as fine arms; but even then it is doubtful if they would get rid of their congestions in the head, lungs, and stomach, without more dress upon the arms and legs.

Perfect health depends upon perfect circulation. Every living thing that has the latter has the former. Put your hand under your dress upon your body. Now place it upon your arm. If you find the temperature of the body over 90° and that of your arm under 60°, you have lost the equilibrium of circulation. The head has too much blood, producing headache; or the chest too much, producing cough, rapid breathing, pain in the side, or palpitation of the heart; or the stomach too much, producing indigestion. Any or all these difficulties are temporarily relieved by immersion of the hands or feet in hot water, and permanently relieved by such dress and exercise of the extremities as will make the derivation permanent.

The most earnest efforts looking towards dress-reform have had reference to the length of the skirt. I think it is one of woman's first duties to make herself beautiful. The long skirt, the trail even, is in fine taste. Among the dress-features of the stage none is so beautiful. The artist is ever delighted to introduce it in his pictures of woman. For the drawing-room, it is superb. When we meet on dress occasions, I cannot see why we may not introduce this exquisite feature. If it is said that expense and inconvenience are involved, I reply, so they are in paintings and statuary.

For church and afternoon-sittings, skirts that nearly touch the floor seem to me in good taste; but for the street, when snowy or muddy, for the active duties of house-keeping, for the gymnasium, and for mountain-trips, it need not be argued, with those whose brains are not befogged by fashion, that the skirts should fall to about the knee.

Dr. Clarke says, — "Since the free expansion of the chest, or, in other words, the unimpeded action of the respiratory organs, is essential to health, the employment of tight stays and those forms of dress which interfere with these natural actions must be injurious, and cannot therefore be too strongly censured."

The celebrated Dr. James Johnson declares, — "The growth of the whole body and the freedom of all its functions so much depend upon perfect digestion, that every impediment to that digestion, such as compression of the middle of the body, must inevitably derange the whole constitution. Although the evils of tight lacing are as patent as the sun at noonday, I have never known its commission to be acknowledged by any fair dame. It is considered essential to a fine figure, yet I never could discover any marks of stays in the statues of the Medicean Venus, or the Apollo. And I venture to aver that the Cyprian goddess was not in the habit of drawing her zone as tight as the modern fair ones, else the sculptor would have recorded the cincture in marble. The comfort and motions of the foot are not more abridged and cramped by the Chinese shoe than are respiration and digestion by the stay." Thus wrote the physician to the father of the present queen of England.

A former professor of the theory and practice of medicine in the university of Vermont says, — "Undue confinement of the chest must at all periods of life be prejudicial; hence the practice of tight lacing we almost always find classed among the causes of phthisis, as well as of numerous other ills." And he adds, — "It is surely an erroneous notion that women need the support of stays."

BEST MATERIAL FOR DRESS.

In all seasons of the year, and in all climates, the best material for dress, for old and young, for strong and weak, is woollen. It is the poorest conductor of heat, and therefore secures the most equable temperature. This is the principal object of dress. The superiority of wool-

len clothing for babes is even greater in July than in January. In the warmest days a single thickness of soft flannel will suffice. But if linen or cotton be worn, the garment is soon moistened by perspiration, and two or three additional thicknesses are needed to protect the child against the ill-effects of a draught.

In warm weather we find it necessary to wear woollen garments in the gymnasium, as a protection against a chill from draughts while perspiring. Our soldiers in the South find flannel their best friend, securing them against the extremes and exposures of their camp and field life. Blacksmiths, glass-blowers, furnace-men, and others exposed to the highest temperatures, find woollen indispensable.

Few practices will do so much to secure the comfort and protect the health of young children as dressing them in flannel night and day, the year round. It may be objected that flannel irritates a delicate skin. This is often so, as the skin is now treated. But there is no baby's skin so thin and delicate that daily bathing and faithful friction may not remove this extreme susceptibility. And as the skin is the organ upon which the outer world makes its impressions, nothing is more important than that all morbid susceptibility should be removed.

An additional advantage in the use of flannel is, that it serves by its mechanical effect to keep up a healthy surface circulation, which is one of the vital conditions of health. The skin and the lungs act and react upon each other more directly, if possible, than any other two organs of the body. Children born with a predisposition to consumption especially need a vigorous treatment of the skin.

Professor Dunglison says, — "The best clothing to protect us from external heat or cold is one that is a bad conductor of caloric, or one that does not permit heat to pass readily through it. This is the case with woollen. The Spaniard and the Oriental throw woollen mantles over them when they expose themselves to the sun.

Londe asserts that "the use of woollen next the skin is one of the most precious means possessed by therapeutics. Its use on children does much to prevent bowel-affections, and with it we can bear with impunity the vicissitudes of weather."

Brocchi ascribes the immunity of sheep which feed night and day in the Campagna di Roma "to the protection afforded them by their wool."

Patissier affirms that woollen clothing has been found effectual in preserving the health of laborers working in marshy grounds, canals, and drains.

Captain Murray, of the English service, after two years spent among the icebergs on the coast of Labrador, sailed, immediately upon his return to England, for the West Indies, where he remained some months, and while other officers lost many men, he returned to England without the loss of a man, which he ascribed in considerable part to the use of flannel. So important did he regard this hygienic measure that he had every man examined daily to ascertain that he had not thrown off his flannels.

A distinguished author writes that the aged, infirm, rheumatic, and those liable to pulmonary disease, are greatly benefited by the use of flannel.

Dr. Willich says, — "Wool recommends itself to us, because it is the covering of those animals most resembling man in structure."

Count Rumford says he is convinced of the utility of flannel in all seasons, that he was relieved by its use from a pain in the breast, to which he was much subject, and had never since known an hour's illness.

The celebrated Hufeland says it is a desirable dress for the nervous, those subject to colds, catarrhs, influenzas, and, in fact, for all invalids.

Another writer says that desperate diseases would be prevented, and many valuable lives saved, by its more universal use.

A distinguished American physician says that flannel next the skin is of service to the consumptive by the irritation

it produces, as well as the defence it affords against the cold.

An English authority says, — "Experience has so fully evinced the utility of covering the skin with flannel, that no person habituated to its use, in our damp climate, can be persuaded to dispense with it at any season of the year."

EXERCISE.

MOTION is the great law of the universe. It is the first instinct of animal life. When it ceases, life ceases. The degree of life may be measured by the amount of normal motion. When the life-forces run low, the natural and most effectual method of invigorating those forces is found in motion.

The popular education of our children is a lamentable violation of this law. The young child, left in freedom, keeps its nurse on the *qui vive* during every waking hour by its uncontrollable activity. The effort which our school-system makes to crush out this instinct, by compelling children to sit on hard chairs, bent over desks, motionless six hours a day, is, considered in its influence upon the vitality of the nation, the saddest of all possible mistakes.

A radical change in this respect is imperatively demanded by the growing intelligence of the people. The Germans, — God bless them! — having given more faithful study to the various problems of human development, have devised better modes. The Kindergarten, one of the many beautiful blossoms of the genius of that noble people, is being transplanted to this country. Wise parents, thank Heaven, and take heart. Miss Peabody's Kindergarten, in Boston, should be visited by the friends of education.

Nothing at this hour is so much needed in the development of the young as some system of physical training, which, under competent masters, may be introduced as a part of the daily drill into all our schools, public and private. The routine should be so arranged that study and physical exercise should alternate in periods not longer than half an hour throughout the day. For example: the school opens at 9 o'clock. The first half-hour is devoted to study and recitation. Let the second be given to vigorous training in the gymnasium under a drill-master, and to music. The third to study and recitation. The fourth to drill, in which those with weak stomachs form a class by themselves, with special exercises; those with weak chests another; those with weak spines still another: all classified and treated according to their several needs. The fifth half-hour to study and recitation. The sixth to declamation, singing, or culture of the vocal organs, in general and special ways. The seventh and eighth half-hours to study, conversation, etc. And again in the afternoon an alternation of intellectual and physical exercises, the latter so ordered as to bring into play every muscle, and thus secure the symmetrical development of the body. Who can doubt that under this system greater progress would be made in intellectual culture than at present? The mind would find more effective tools for its work. But, with an incredulous shake of the head, the people say, "Yes, this is all very fine, but quite impracticable." If by this they mean that it is not practicable until the public conscience is better enlightened, I grant the force of the objection. But if they mean to say, that, with a due appreciation of physical culture, such a school is an impracticability, I am confident they are mistaken. The order I suggest could be introduced in a week in any existing school, did the parents and teachers so will. I am happy to be able to say that such a school as I have described, possessing all the best facilities for classical and scientific instruction, and under the management of eminent educators, will be opened in an American city within the present year. The school has been determined upon from the conviction that only in beginning with the rising generation can the results of physical culture, or the system combining both physical and intellectual culture, in their natural

relations, be thorough and satisfactory, and that the results of this experiment would do more than all that can be said or written to arouse public attention.

Sweetser says, — "Were I required to name the remedy which promises most aid in the onset of consumption, I should say, daily gentle and protracted exercise in a mild and equable atmosphere. . . . . Exercise, moreover, determines the blood to the surface of the body, rendering the cutaneous functions more active and healthful, and may in this way also contribute to the advantage of the lungs."

Dr. Parrish says that "vigorous and free exposure to the air is by far the most efficient remedy in pulmonary consumption."

Dr. Pitcher states that "the consumptive Indians of the Osage tribe have their symptoms suspended during their semi-annual buffalo-hunts, but that these soon return on becoming again inactive in their towns."

Dr. Rush informs us that he saw three persons who had been cured of consumption by the hardships of military life in the Revolutionary War. The same distinguished authority affirms that "the remedy for consumption must be sought in those exercises and employments which give the greatest vigor to the constitution."

Dr. Chambers, physician to St. Mary's Hospital, says,—"If we examine the history of those who have lived longest with consumption, we shall not find them to have been those who have lived in-doors, hanging their lives on their thermometers." He gives the case of a friend of his "who from his youth has had tubercular disease, but has kept hounds, contested elections, sat in Parliament, but never allows any one to doctor his chest."

Lord Bacon asserted that "there was no disease among pupils that gymnastics and calisthenics could not cure." And Galen declared "him to be the best physician who was the best teacher of gymnastics." While Dryden, long ago, sang,—

"The wise for cure on *exercise* depend."

Consumptives are advised to ride on horseback, to make long journeys in the saddle. This is doubtless one of the most valuable exercises. There are numerous well-authenticated instances of cures by its means, even in the advanced stages of the disease. But many persons cannot avail themselves of its advantages. In our cities, not one phthisical invalid in ten, especially among women, can command facilities for daily horseback-riding, still less can they take long journeys.

Hunting, fishing, and mountain-air are advised. But how can many who reside in towns and cities, and who most need muscular training, secure such recreations?

Walking is very generally prescribed, and is doubtless the most available of the exercises named. But in the case of women, the present mode of dress seriously interferes with the ease and physiological benefits of this exercise; and few would exchange the long skirt for the short one with pantalets or Turkish trousers. And yet this change is indispensable to the best results.

While I would encourage all out-door exercises and amusements, it is evident that exercises which can be introduced into every house, which may be practised by persons of both sexes, all ages and degrees of strength, and which possess such fascination as shall make them permanently attractive, are greatly to be desired, to meet wants not otherwise supplied.

Many exercises have been advised with reference to general health and strength. I submit a series possessing peculiar virtues for the consumptive. To him all exercises are not equally profitable. Ten movements of a sort adapted to his special needs are worth a hundred not so adapted. He has a narrow chest and drooping shoulders. This distortion results in displacement of the lungs. And yet he may have legs and hips comparatively vigorous. Ten movements concentrated upon those muscles whose deficiency permits the drooping of the shoul-

ders will be more valuable than a hundred for the legs. There are several hundred muscles in the human body. In every case of consumption certain groups of these muscles are defective. Restoration of the lost symmetry calls for those exercises which will develop the defective groups. Prescribing a walk for a patient whose legs are already vigorous, but whose arms and shoulders are contracted and weak, is like prescribing a medicine because it *is a medicine*, without regard to the nature of the malady.

A blister applied to the chest relieves pain within. It accomplishes this by drawing the blood to the surface, and thus subtracting from the congestion at the point of disease. If the blister were applied to the foot or leg, it would not sensibly relieve the congestion in the chest.

If, instead of applying a blister, we use exercise as the remedial measure, and by drawing blood into the muscles we would relieve the congestion within, the importance of subtracting from the vessels which bear the blood to the diseased part is not less than in the case of the blister. For the relief or cure of disease in any of the chest organs a few well-directed movements of those muscles about the chest which lack circulation will accomplish more than hours of walking.

The intelligent physician, in prescribing muscular training, will not say, simply and generally, "I advise you to exercise," but he will indicate the particular exercises applicable to the case. He will first thoughtfully ask, "What group of muscles is defective?" When he has answered this question accurately, he is prepared for a second, — "What exercises will bring into direct training the defective group?" When these points are settled, he can direct the training wisely. To recommend horseback-riding — good as it is — for *all* consumptives, is not a whit more discriminating than to prescribe a particular variety of food for all invalids. The medical man who has a general formula for a certain class of patients is hardly more thoughtful than the vender of the "all-healing ointment."

Little or no attention has been given to the vital subject of exercise as a curative means. In many cases treated by Ling's methods, when skilfully applied, the results have been so marvellous that medical men who had not studied the philosophy of the Movement Cure have attributed the rapid improvement to Animal Magnetism. They could not conceive that muscular exercise alone could produce such wonderful results.

Symmetry of body and mind is vital to health. Its loss in the mind leads not unfrequently to insanity, — its loss in the body to numberless maladies. The great defect in our system of education lies just here. There is no discrimination between the members of a class, part of which needs one kind of culture to produce symmetry and health, while another part needs quite another. The gymnasium, where all perform the same exercises, may be charged with the same radical defect. In a school for thorough mental or physical training, pupils must be classified and trained with reference to their individual needs. This principle underlies the successful treatment of consumption. He who would contribute to its cure by exercise — the most efficient of all possible remedies — must not say to his patients simply, "Exercise, exercise, exercise," but he must distinctly mark out those exercises which are precisely adapted to the case of each.

As an additional reason for discrimination in prescribing physical exercises for consumptives, it may be mentioned that in almost every patient belonging to this class there are complications with other diseases each of which requires consideration.

EXERCISES POSSESSING PECULIAR VALUE FOR CONSUMPTIVES.

MOST consumptive invalids are indisposed to exercise, and particularly in-

disposed to employ their arms. Many attempt training of the shoulders and chest, and abandon it in disgust. But if in the systematic performance of the exercises other persons are interested, the patient cannot withdraw. Besides, those exercises in which others participate have social attractions, to which consumptives, as a class, are peculiarly susceptible.

For example, a consumptive young lady has brothers who assist her in certain prescribed exercises. These are to be executed twice a day, at hours when the brothers are at home. There is an affectionate interest in the group with reference to the pleasant duty. It is not forgotten. Suppose the brother is the patient, the sisters or mother will act as assistants. In every family such exercises are sure of the proper attention. I need scarcely say, that, if the patient undertake to exercise alone, with dumb-bells or some similar means, it will soon grow tiresome, and be abandoned.

Moreover, it is a matter of no small moment that other members of the family — who are not unlikely to be predisposed to the same malady — will thus secure a series of profitable exercises. I must add my conviction, that by no other variety of training can the efforts be so accurately directed to the muscles whose weakness permits the distortion of chest which is often the exciting cause of the malady.

With a good-sized room, and open windows, the air may be pure, while the exercise will prove the occasion of a thorough ventilation of the house.

I am indebted to Friedrich Robert Nitzsche of Dresden for the drawings of the accompanying cuts. His works are invaluable.

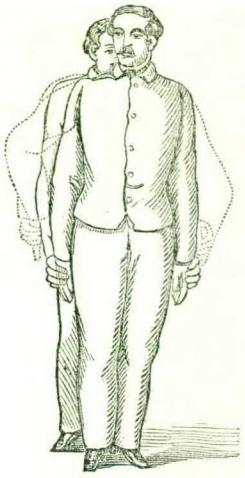

Fig. 1.

Fig. 1. Assistant, standing behind the patient, grasps his hands. Patient draws up the hands, as shown in the dotted lines, assistant resisting. Patient forces his hands back again to the first position, assistant resisting. Repeat five times.

In this, as in the other exercises advised, *the resistance should be adapted to the patient's strength.*

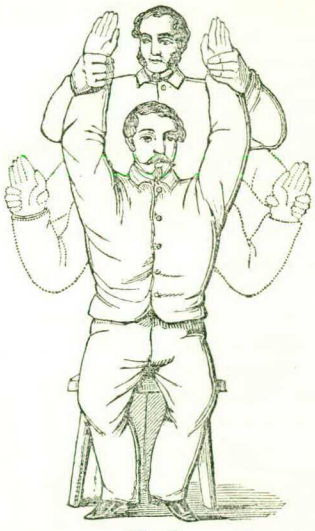

Fig. 2.

Fig. 2. Assistant, standing behind the patient, who is seated, grasps his uplifted hands. Patient draws down the hands, as shown by the dotted lines, assistant resisting. Patient forces the hands back to the first position, assistant resisting. Repeat three times.

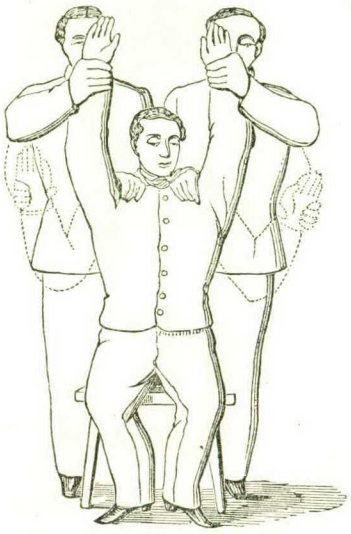

Fig. 3.

Fig. 3 shows an improvement on Fig. 2 for those cases in which, either from the strength of the patient or the weakness of the assistant, it might prove more agreeable to employ two assistants.

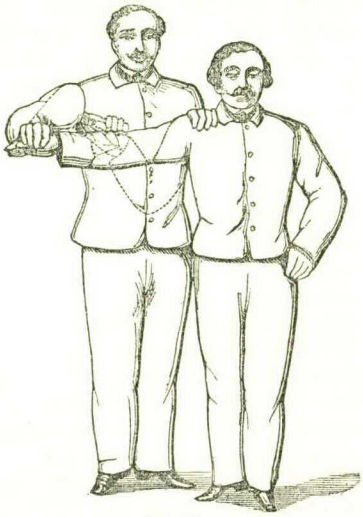

Fig. 4.

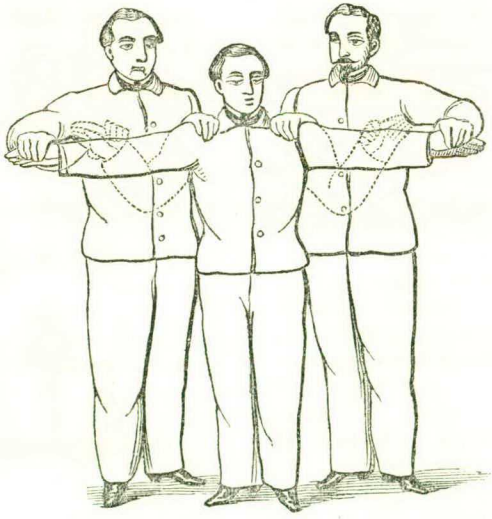

Fig. 5.

Figs. 4 and 5 represent an exercise which hardly needs description. The patient should exert the positive force in both directions, the assistants resisting.

Fig. 6.

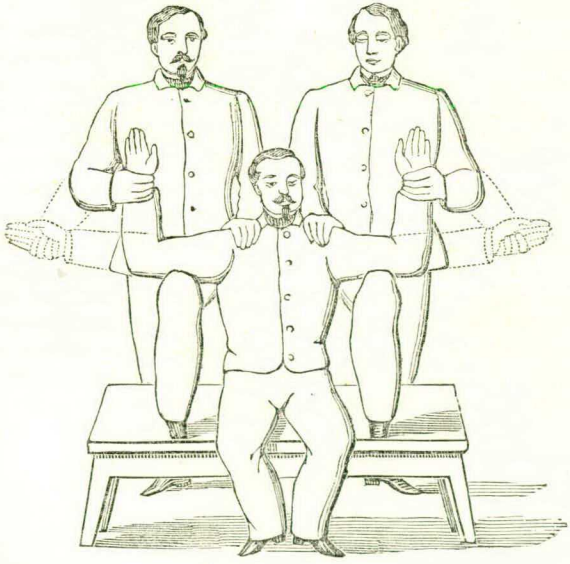

Fig. 7.

Fig. 6 or 7 may be used next in order.

Fig. 8.

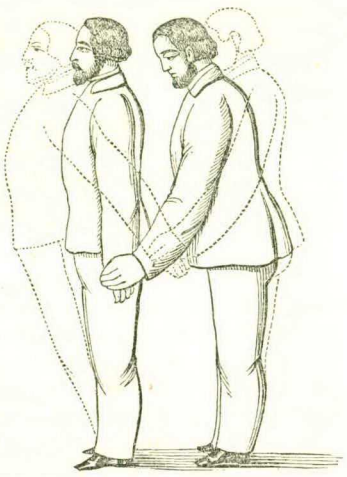

Fig. 9.

Fig. 8 shows an exercise valuable in the treatment of drooping shoulders. When the patient has raised his arms, as in the dotted lines, he may bring them back to the horizontal in front, without the interference of the assistant.

Fig. 9 illustrates an exercise which may be used twenty or thirty times, if managed with gentleness.

I cannot here undertake to say how often these exercises should be employed, nor in what cases; they are given merely as suggestive. A complete series of "Mutual Help Exercises," adapted to the treatment of the consumptive, includes a large number, many of which are not only valuable, but cannot fail to deeply interest all concerned.

If to the Mutual Help Exercises it is desired to add those in which the health-seeker can work alone, I would suggest the new exercises with the wooden dumb-bell, wand, and club, and the one hundred and seven exercises with Schreber's Pangymnastikon.

Consumption — genuine tuberculous consumption — can be cured, even in the stage of softening or abscess. Dr. J. Hughes Bennett, Professor Calkins, Dr. Parrish, Dr. Carswell, Laënnec, Professor Lee, Dr. Abernethy, Sir James Clarke, and fifty other distinguished authors, declare their faith in its curability.

In not less than a thousand *post-mortem* examinations, the lungs have exhibited scars, concretions, or other indubitable evidences of recovery from genuine consumption. I have cured many cases with exercise and other hygienic agents.