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ORIGINAL ARTICLES.

THE CONSIDERATION AND CURE OF CHRONIC TUBERCULAR CONSUMP- TION OF THE LUNGS.

*Read in the Section of Practice of Medicine and Physiology, at the
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tion, held at Washington, D. C., May, 1891.*

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In the preparation of this paper I have endeavored to be as concise as possible consistent with clearness; I have employed the terms phthisis, tuberculosis and pulmonary consumption as expressing the same pathological condition.

The progressive tendency of the tubercle of phthisis is of a fibrous nature, or a leaning toward healing or health; becoming through this means a self-limiting condition. The direct reverse of the tubercle of cancerous and other inflammatory ulceration.

I have for many years maintained by theory, and shown by actual results, that pulmonary tuberculosis may be cured, even after extensive degeneration of lung tissue has taken place; provided the constitution has not become vitiated by disease or other causes, or its recuperative powers destroyed by old age.

We now find this assertion copiously substantiated by eminent authority. Given suitable handling, in all that the term implies, and the extent of the depredation will take care of itself; it will make little difference whether prognosis has limited the life of the patient to a certain number of weeks or months.

It is the cowardly attitude of settling down to palliative measures that has wrought the mischief in the past. Such means exclude all recuperative agents, and serve to deprive every organ of its normal activity in the performance of its functions, as a result favoring the destruction already going on.

This idea that a person must be doomed to die of phthisis because one of his parents were its victims seems now about to be thrown into the rubbish of the past, and the sooner this absurdity can be removed from the mind of the public the better.

GENERAL TREATMENT.

My thesis written in 1857 was entitled, *Pure Air, Pure Water, Cleanliness and Exercise*. Their importance in the prophylaxis and cure of disease.

From the time I commenced practice these agents have been my best allies. In my surgery, air, water and cleanliness have been my antiseptics, pure water doing for me what corrosive sublimate, iodoform, etc., have accomplished in the hands of others.

In 1862, I first read Chamber's Lectures on the Renewal of Life, and so impressed was I with the truth of his reasoning that I have kept that object in view in the treatment of disease in every form ever since. The number of cases of chronic pulmonary tuberculosis that have come into my hands for treatment are, according to my reckoning, about 3,000, exclusive of those I had in the United States Army. Every case shows me yet more plainly the folly of attempting to adopt a routine which shall be applicable to all tuberculous patients. The treatment of every patient must be a problem unto itself.

By no means is it essential for the same unfavorable elements to combine in order to bring about certain results. The susceptibility of the individual to certain conditions must be considered. We must meet every condition, physically, mentally and morally, and in this way regard his case as entirely distinct from any other.

While the various theories as to predisposing causes, hereditary tendencies, and the means of combating them have not embraced all the elements of success, still they have given us all the light we have had upon this dark subject, and so far as hygienic influences have been recognized they are deserving of our highest consideration.

Until the bacillus made its shadow upon the screen of our observations (whose office it seems to me should be regarded as that of a very lively interrogation point, rather than as a period to all future questionings), the trend of the past few years had been towards recognizing in Nature a powerful factor in the prevention and cure of consumption.

Let us not get bacilli mad! Cannot we have a case of pulmonary tuberculosis on our hands and not yet be able to find these little fellows;

the very recent knowledge of whose existence seems to have wrought a condition in our brains as disastrous as their presence is credited to produce in the lungs of our patients?

Let us not forget our modest days of small things, before bacilli were known, and thus carefully avoid the danger which now seems to be threatening of ignoring all other means of diagnosis in our frantic search for the revelations of the microscope.

Nor will we permit this to let us slight the premonitory warnings of the approach of this disease, and thus encourage the baneful tendency to dismiss, with some simple opiate, a slight cough, protracted cold, irritable throat, etc., because as yet the expectorations have failed to yield the little wriggler whose presence only shall determine the tuberculous condition.

If tuberculosis must owe its existence to this alone, then I shall maintain, at the expense of paradox, that he who would cure chronic pulmonary tuberculosis must begin the cure before he finds the disease in his patients.

Build up the general health of the consumptive so that his chemico-vitalizing function will be sufficient to destroy the bacilli. In fact, put every patient into such a degree of health that he shall be his own bacilli-killer.

Bacilli cannot exist in perfectly healthy lung tissue. It must become diseased before it can offer sufficient inducement for him to live and propagate in it, and upon its resumption of health the tenant vanishes.

HYGIENIC INFLUENCES.

A perfect familiarity with the daily life of our patient must be our first consideration. Our surroundings make us what we are, physically as well as morally and socially. Man is like the chameleon, every part of his nature partakes and is made up of his surroundings. "Show me your friends and I will tell you what you are." This is as true of the physical as of the moral man.

If our treatment could begin with the birth of the patient, in 99 per cent. we should have no tuberculosis to treat, no matter about the family history.

Fear is a powerful provocative to physical degeneration. Take the condition of the poor. It is not generally their immediate wants which cause the catastrophe. People who are habitually poor are not necessarily feeble, but those who have lost their wealth are the sufferers. Fear as to the immediate future for themselves or others; with this instinctive nervous shock the body shrinks, all the organic functions are disturbed. Especially is this true of the respiratory functions. Fear of any sort has a depressing effect upon the respiratory centre. This is as true of animals as of men. Anxiety is but a species of fear.

It is futile for us to shut our eyes to the reflex action which the mind throws upon the physiological powers. We see proofs of it every instant, yet dispute it, and call it unscientific. What are we striving to accomplish in our treatment of disease? Is it not our aim to coax, by all manner of means known to us, this vital principle called Life to tarry yet a little longer in its diseased encasement? Then give its presence a just recognition by attributing to it a capability both creative and destructive, a reality though intangible.

EXERCISE.

The various mechanical arrangements now in vogue for indoor exercise are generally to be commended. The patient must be imbued with the determination to get well. He must be made to understand that much depends upon himself. That he must exercise as well as eat. The exercise must be accumulative, doing a little more every day, and the nourishment must also be accumulative. The amount of exercise he can bear will depend upon the amount of strength-giving food he can assimilate, and vice versa.

RECREATION.

The recreations should be of a nature that will inspire an interest on the part of the invalid in their accomplishment. There should be an importance attached to them requiring some thought. The unemployed mind is a powerful depressant to the nervous forces. Let the daily walks and rides have some purpose, if nothing more than the performance of the domestic errands of the family. If he loves art and music his tastes should be gratified. There should be a moderate indulgence in out-of-door sports, as bicycling, ball, surf-bathing when allowable, horseback riding and skating. Our lady patients have their gymnastics, tricycle, horse-back riding and skating, and of great importance, their vocal gymnastics. This will expand the lungs and strengthen the pectoral and respiratory muscles. Being a pleasant recreation, and at the same time a most excellent means of bathing the air-cells with oxygen and teaching the vocal organs the proper performance of their functions. After a few weeks of judicious practice the dimensions of the chest will be found to have increased from four to five inches.

Practicing at the piano, needle-work or any employment which requires close application and necessitates contraction of the chest walls in its performance, should be forbidden.

DAILY CARE OF THE PATIENT.

Our phthisical invalid should have the constant attention of a well-trained nurse. His room must be sunny, with pleasant prospect from the windows. No stuffy furniture, no carpets, no fancy articles hanging or standing about, ready

upon their slightest agitation to disseminate the accumulated dust of stagnation and disease. If possible, the walls of the room should be painted. They can then be wiped off occasionally with some disinfectant, as borax water or Platt's chlorides. Place pine, spruce or fir boughs about the room and under the bed the patient occupies; this will impart to the atmosphere an agreeable odor, and has undoubtedly the effect of calming laryngo-bronchial irritation and diminishing the frequency of the cough. I am convinced of the benefit of breathing this air. It is also well to spray some agreeable antiseptic about the room, as essence of cinnamon, clove, gaultheria, eucalyptus, etc.

The bedstead should be of metal, having a fine wire spring, hair mattress and fine wool blankets; no draperies.

If possible, let the artificial lighting be of electricity, but if gas must be used, see that the burner is a proper one to consume all the gas as it is forced through. Avoid lighting or heating by kerosene oil; a kerosene lamp or heater consumes more oxygen than the patient does himself.

The temperature of the room should be equable, ranging from 68° to 70°, and in the damp and rainy days of summer it must be made dry by a grate fire or some other form of heating.

The underclothing of the patient should be of wool the year round, and changed every day. There is no necessity of encasing him in very thick, unyielding flannel; it seems rather to produce a weakening effect by preventing the free escape of the exhalations of the body; those which are loosely worn and of light weight and soft texture serve a better purpose.

The nurse must be able to manipulate the patient's body, rubbing, lightly pounding or patting and beating with a whisk broom. In beating the surface in this manner it has a direct stimulating effect upon the peripheral nerve-endings, and produces a vitalizing influence that cannot be obtained in any other way; for in the broom we have anywhere from 1,000 to 2,000 twigs of different sizes, and this beating of course produces as many different vibrations upon the nerves and nerve-centres, thereby increasing wonderfully the power of the skin in appropriating oxygen and nutrition.

The bowels should be kneaded; a most excellent process for obstinate constipation. Rubbing with flannel may at times replace the bath when the patient feels a repugnance to water. The limbs should always be rubbed towards the body. Rubbing with flannel charges the person with an amount of electricity which cannot be produced in any other way.

In women patients there must be absolute freedom from dragging skirts, tight bindings and garters. The dress must allow perfect liberty of action in chest and limbs. I do not object to

corsets if they are worn loose, if the patient insists that they are a support to her; in the place of injury, I think they are a benefit; but they must be worn loose enough to not interfere with the movements of the diaphragm. She should wear felt shoes, neither laced nor buttoned tight around the ankles; cold feet at night invariably follow the wearing of closely-buttoned boots during the day.

FOOD.

While pure air may be prescribed without limit, and the same sanitary surroundings are equally beneficial to all, yet when we come to the question of diet, we cannot prescribe in a general way; we must be guided by the likes and idiosyncracies of our patients. We may find one to thrive on pure milk and occasionally one who can take cod-liver oil with benefit, while the digestive organs of another will be thrown into a terrible state of disorder by these agents.

The patient must have regular times for eating solid food. It must be taken at least every four hours, and drinks between times, of milk, beef tea, aromatic teas, gruels, fruit juices, etc. Milk when well borne and assimilated is nourishing, strengthening, and fattening, and we have great occasion to be glad when we find it can be taken in large quantities and digested. Unless we can get milk that is fresh from the cow, the condensed milk without sugar is preferable to old milk.

Infusions of malt, when properly made, may be taken by nearly every one. And instead of undertaking the digestion of thick malt extracts a simple infusion like the following will be much better: Malt in coarse powder, 4 ounces. Water heated to about 85° F., 12 ounces. Macerate for four hours at a temperature of about 100° F. Then gradually raise it to about 130° for half an hour; strain this infusion with strong expression and add one grain of salicylic acid. This quantity can be taken every day; it can be flavored at any time by adding a drachm of hops, chamomile flowers, or any of the aromatic herbs. This will be found far superior to any of the thick malt extracts. I do not advocate the use of cod-liver oil; as a usual thing it will derange the stomach and prevent the patient from taking a due amount of suitable food. Cod-liver oil cannot supply the place of meat, bread and butter, but meat, bread and butter can more than supply the place of cod-liver oil.

Man being omnivorous, should have variety in his food. Juices of meat, and the fat of newly made butter and sweet cream. Also vegetables cooked with some good fat meat should form a part of his diet, but in very small quantities. The expressed juice of different kinds of berries, pineapple, etc., may also be partaken of. The consensus of opinion has been that meat is better the

longer it has been kept, but I contend that the sooner meat is eaten after it is slaughtered the more health and life-giving properties it has; the same is true of milk, the sooner it is drank after being drawn from the udder the better.

All food should be disintegrated when eaten with copious draughts of pure water or some agreeable aromatic tea. This I have always maintained, through the long-drawn misery of the dry food mania, at the expense of severe criticism from my professional brethren. The patient should consume at least three pints of water in the twenty-four hours, and more if necessary. We know that water forms three-fourths of our animal economy, that it enters in the same proportion into all animal life, hence consumptive patients must take a large amount of liquids. We also know that water has solvent powers, that it will often overcome the most obstinate constipation, that it is also a powerful medium for removing effete matter from the body, acting on the alimentary canal both mechanically and chemically by changing their atonic condition and enabling the absorption of nutritious food. The addition of one-third to one-half parts of pure water to milk has been more effectual in preventing the formation of curd than lime-water, and a mixture of equal parts of water and milk, or infusion of malt, will quench the thirst of phthisical patients, reduce the temperature, and have a quieting effect. Not unfrequently this can be borne better than either separately.

Ice-cream made from rich cream and milk may be eaten sparingly when the patient is feverish and craves cold food and drinks. The peptonized milk of Reed & Carnrick is good, and adds to the variety, also their beef peptonoids. Never allow the patient to eat yeast-made bread, it must be made from cream-of-tarter baking-powder, and twice baked, (*i.e.* lightly toasted).

The food must be varied; surprises in the way of unexpected dishes are a stimulant to the appetite. Fresh beef broiled, or scraped and eaten raw, or made into little pats and nicely seasoned and sparingly broiled over the coals; or, have the lean meat, free from fat and fibrous tissue, chopped in an enterprise chopper and to each pound of meat add one-fourth pound of fat breakfast bacon. This can be carefully broiled, salted and flavored to the taste and makes a most toothsome morsel. The patient rarely tires of it. He should eat from two to three pounds of this during the twenty-four hours.

Pig meat is not the worst kind to eat by any manner of means. I have no reference to the New England hog fed on slops, wallowing in filth, shut up in a seven by nine box without fresh air from birth to the day of slaughter. I refer to the much maligned western hog, that knows not what filth is, that from its earliest predecessors has had pure air and cleanliness, and been fed on

nuts, corn and wheat. Such meat is healthy and digestible. One or two teaspoonfuls of gluten may be included in the diet, cooked or uncooked, as suits the stomach. Fish can be partaken of once a week, also oyster and clam juice.

The patient should not be made to eat alone in his room; the pleasures attendant upon eating have much to do with results. Shut off from a life of activity, the feeling will come sooner or later according to his temperament, that he is a doomed man. There is always a tendency in the person suffering from any chronic ailment to foster the idea that he is of no account in the world because of his debility.

The object of the diet should be to nourish, strengthen and fatten. When we find our patient digesting his food, picking up in flesh and getting stronger every day, we have reason to believe his recovery is not only possible, but probable.

SLEEP.

"The death of each day's life,
Sore labor's bath,
Balm of hurt minds."

Sleep is but another form of food, and is not less essential than the food we take into our stomachs.

No matter what the disease, we know its malignancy has yielded when the periods of long, sound, natural sleep advance. As a prophylaxis, sleep ranks among the most important. Only through sleep can the nerve-centres relax and recuperation begin.

During the night of healthy sleep the scavengers of the body are working noiselessly with their implements of conveyance, preparing for the morrow's labors.

Darkness is the period of perfect rest. Until the human mind discovered the means of substituting by artificial light that of the sun, mankind retired with its declining rays. Children—of whom it has been said, their life, as it develops, give a fair representation of the lines of human progress—naturally seek repose at sunset. Nature herself at this time seems to be hushing all animated life to sleep upon her bosom.

How different is man under the influences of civilization! Insomnia and neurasthenia are the terrible beasts born of his enlightenment. Lashing their victim night and day until he would willingly offer his soul in exchange for the sound healthy sleep of the barbarian!

Insomnia is to-day the most familiar foe we meet, so prolific in its capacity that without exaggeration or fancy we can ascribe to it the common beginning of a vast part of our chronic ailments. It has come to have an *individuality*, and is no longer a symptom only. One of the common causes of this is the artificial light which is found in the majority of sleeping-rooms during the night, not only of lamps and gas, but the rays of

the electric light stream through our windows. Although the eyes may be closed, we are conscious of the changes in its flickering glare. The patient becomes accustomed to it and feels that he cannot have it excluded, and so we have added another to the "necessities of civilization."

Not the sleep to be had during the day, but the repose at night must be encouraged in the patient. Discipline will do much toward capturing this sly visitor, other things being equal.

The patient must retire early, he should not exercise his brain by reading or talking after seven o'clock. In summer he should be in bed for the night by eight o'clock, and in winter by seven o'clock. In the summer he should rise in the morning between five and six o'clock, and from seven to eight o'clock in the winter. The room should be of a proper temperature, so he experiences no chill in bathing and dressing.

The night-dress of the patient should be of sufficient thickness to protect the body and allow perfect freedom of movement and position without risk of chill. The flannel undervest worn during the day should be removed at night and one of lighter weight substituted. Bathing before retiring has a tendency to induce sleep. It should be accomplished in a manner the least calculated to task the patient's strength. If the temperature is normal, a wet cloth passed over the body and wrung out in fresh water may take the place of the bath; rub the skin well afterwards.

If the feet are cold they must be made warm and kept so; the means to be employed for this purpose are very numerous. Among the best are, the wrapping each foot in flannel separately, and the hot water bag (but the old-fashioned hot soap-stone is better). These are only palliative; for the removal of this condition there is nothing equal to manipulation done after the following: Begin at the nape of the neck, placing the ends of the first and second fingers firmly on each side of the spinal column, carrying them firmly and evenly downwards its whole length; repeat this several times. After this rub well the soft hollows in the ankles each side of the heels and around the joints. The patient will soon begin to feel the blood rushing into his feet, and ere many nights he will have the satisfaction of seeing a healthy circulation established in these parts.

Beef tea, beef peptonoids or some other light form of food should be served the patient directly on his awakening in the morning.

PURE AIR.

When practicable the person should be sent into a hilly district where he can have the advantages of a high and dry atmosphere. Avoid lakes and all bodies of fresh water. Otherwise as good air can be obtained in the city as in the country.

Boston is particularly fortunate in this respect. We should be grateful for the easterly winds, though they have given our town an unfavorable notoriety. Their salty breath cool and purify the atmosphere and render it a habitable city in the summer, even in the meanest localities.

I believe the bedrooms of the populace are generally tolerably well ventilated.

A certain class of enthusiasts upon the subject of ventilation have fallen into the error of overdoing the thing, or in doing it so badly that it becomes an injury, by allowing the air to come in stratas, making a draft upon the sleeper, whose powers of resistance are diminished.

It is a good plan to have the ventilation come through the windows of an adjoining room when possible. As the sleeping person does not require so much air as when he is up and around, it is not necessary that he should be deluged in a constantly changing current.

BATHING.

The superficial application of moisture to the body which the patient receives at night is not for cleanliness. He should have a daily bath, adding to every quart of water a teaspoonful of powdered borax or tablespoonful of aqua ammonia. Also use soap having an agreeable perfume. After he has been well wiped with a rough towel he should be anointed with nice fresh lard thoroughly beaten to a creamy consistency and perfumed to suit the fancy of the patient. Instead of the lard, petroleum, cocoa butter, cottonseed oil, can be used, perfumed by the addition of some agreeable essential oil. The Turkish bath, shower-bath, cold pack, all have their place, and the hot spinal rubber bag for hæmoptysis.

MEDICAL TREATMENT.

It would be impossible for me, in a paper of this nature, to enter into details of treatment for every tubercular condition, so I have grouped in the following lists the remedies I use for the various requirements of the disease, employing them singly or in combination as occasion may require.

The first thing to be considered for our consumptive is his power of digestion and assimilation. His food must nourish and strengthen.

I find in the majority of cases it is beneficial to begin treatment by giving from one to five grains of calomel at night, followed in the morning by one or two drachms of sulphate of soda. This I should do whether the tongue be clear or foul, whether there be diarrhoea or constipation. Repeat for two or three nights as indicated; at the same time he must sip one-half pint of hot water slowly at least half an hour before meals. If there is tendency to constipation after the calomel and soda have passed off, give one or more of the following remedies:

FOR CONSTIPATION.

Sodium phosphate, sodium sulphate, magnesium sulphate, oleum ricini, rhamnus frangula, rhamnus purshiana, euonymus, atro-purpurius, juglandis cinera, sulphur. Appropriate doses after meals of one or more of these remedies, not only act as peristaltic stimulants, but they favor the process of nutrition; the patient gains in appetite and strength.

After the whole alimentary tract has been brought into the best condition possible, so that the patient has a good appetite and is digesting his food well, the following pill may be given: Zinci cyanidi, aurei cyanidi, zinci oxidi, thirty grains; extract cannabis indica, six grains; extract ignatia, three grains, glucose quantity sufficient to make thirty pills. Give one pill after the three principal meals.

Among the appetizers I have used the following infusions: Absinthium berberis, calumba, cannabis indica, benzoin odorifirum, baldo, calisaya bark, gentian and quassia.

For the general cachetic condition of the patient's body (after the condition of assimilation has been accomplished), I have employed on different occasions the following, using them singly or in combination, as occasion seemed to demand: Aurum et sodium chloridum, aurum cyanidum, calcium chloride, calcium iodide, calcium sulphuratum, cuprum arsenicum, sodium arsenicum, hydrargyri cyanidum, hydrargyri corrosivum chloridum, hydrargyri bin iodidum, sulphur, ferrum cyanidum, zinci cyanidum, potassii sulphuretum, nitro-muriatic acid, phosphoric acid, malic acid, creosote, guaiacol, terebene.

INFUSIONS.

Rhamnus purshiana, rhamnus frangula, leptandria, hydrastis, euonymus, populus tremuloides, pyrus mallus, pyrus Americana, stillingia sylvatica, rumex crispus, phytolacca decandra, alnus rubra, benbenis aquifolium.

FOR THE DIARRHŒA.

The following infusions may be given: Blackberry root, sumach bark, pulverized coto bark, logwood. Also tincture of ipecac, and bismuth subnitrate, bismuth salicylate, acidum carbolicum, salol, zinci oxidum, cuprum arsenitis, oleum ricini, and enemas of warm water with hydrastis.

I have also used the following powder a great deal: Zinci oxidi, two grains; sodii bicarb., five grains; pulverized coto bark, one grain, mix. This makes one powder. Take this amount after every meal. Also give cooling, healing drinks, as flax-seed tea, slippery elm, etc.

The hot stomach pad is of great benefit in all stomach and bowel diseases. It removes flatulency, pain, distension, etc., and is valuable in inducing sleep at night. It is made by taking

1. Eight thicknesses of thick cotton crash, 12 x 6 inches.

2. A cotton flannel binder, 12-14 inches wide, and long enough to go around the body, with tapes sewed on the ends to secure it.

3. A duplicate of the latter made of waterproof or mackintosh.

4. The same made of flannel.

The pad must be put into boiling salt water in proportion of one ounce to a pint, then wrung out and applied to the stomach and abdomen as hot as can be borne. Tie the flannel binder, the waterproof, and lastly the outside flannel tightly. When cold it must be removed, put through the hot water again and re-applied. This can be worn two or three hours every day after meals, or if much pain is present, it must be worn constantly. It will improve digestion and promote assimilation to a wonderful degree.

DIGESTIVE FERMENTS.

We have two animal ferments, pepsin and extractum pancreatis; our selection must be governed by the nature of the indigestion. Of the vegetable ferments we have a variety; among them are juice of the carica papaya (South American paw paw); asimina triola, juice of the unripe fruit; anassa satina (pineapple), juice of the ripe fruit; infusion of ficus carica (fig), drosera rotundifolia; musa sapientum (banana), juice of ripe fruit.

For the fever of the first stage I have found selections from the following to be all that were required, used either singly or combined, according to conditions: Norwood's tincture of veratrum viride, tinctures of aconite, gelsemium, lycopus virginica, comicifuga, also antimonii et potassii tartaras.

I find these give better results than the newer antipyretics, as acetanilid, antipyrin, etc.

Fever of the second stage: Salicylic acid, salicina, acetanilid, antipyrin, phenacetin, quinia hydra-bromate, salicylate of ammonia.

For the night sweats: Atropia sulphate, picrotoxin, malic acid, zinci oxidum, zinci cyanidum, tincture cocculus indicus, sage tea.

For the sore mouth and the follicular ulceration of the mouth and pharynx. Touch the ulcerated spots with a sulphate of copper crayon, and rinse the mouth with a solution of chlorate of potash of the strength of eight grains to the ounce of water, and one drachm of glycerine. (But a few spots should be treated at one time.) In the sore mouth where the mucous membrane looks red and shining, an infusion of rhus glabra or prinus verticillatus, or hydrastes, alnus rubra, and salix nigra may be used with glycerine, one drachm to the ounce. Rinse the mouth freely.

If the secretion of saliva is scanty, the addition of a vegetable acid to the infusion will be necessary. If profuse, add an alkali, as the bicarbonate of sodium or potassium.

For the cough: The general constitutional treatment with the mouth washes, gargles and inhalations, will be all that is necessary unless it should be so troublesome that the patient cannot sleep at night. In that case, give one-third of a grain of codeina, with one-twentieth of a grain of apomorphia hydrochlorate, at bed time. I give preference to the simple codeina to any of its salts. I find it works better.

For a loose cough: Nitrate of sanguinaria, one grain; sodii phos phus, one-half drachm, simple elixir, glycerine, of each two ounces; tincture phosphora, one drachm; mix and give from one-half to one teaspoonful every three hours, in an infusion of pine bark tea.

For asthmatic cough: Nitrate of sodium, nitro-glycerine, weak alcoholic tincture of grindelia robusta, inhalations of nitrate of potash paper.

For the *intercostal neuralgia* the following liniment will give great comfort and relief: Olei ricini, olei terebinth, olei eucalypti, of each one ounce, camphor, two drachms, chloroformi, four drachms. Mix and apply morning and night, with long continued friction.

For inhalation: Guaiacol, styrone, olei eucalypti, of each two drachms; alcohol one ounce, chloroformi two drachms, mix.

This should be used with a perforated zinc inhaler, for fifteen minutes at a time, every two or three hours during the day. Or the following: Balsam tolu, balsam peru, balsam storax, olei eucalyptus, of each one ounce, alcohol twelve ounces.

Digest for six days and filter, add to this mixture one ounce of beech-wood creosote and one ounce of chloroform. Put fifteen drops on a perforated zinc inhaler and use fifteen minutes every two hours during the day.

Another good inhalant is cold infusion of prunus virginica, four ounces; oil of bitter almonds, two drops; hydrocyanic acid, dilute two drachms; chloroform, half a drachm.

Mix and inhale five minutes every two hours during the day, through a Laforme or similar inhaler.

SPECIFIC HYPODERMIC AND PARENCHYMATOUS TREATMENT.

Hydrargyri chloridi corrosivi, one grain, sodii chloridi, one-half ounce, aqua fervens, dist. four ounces. Mix and filter. Begin by giving five minims subcutaneously into the cellular tissues every day, increasing one minim a day until fifteen minims are reached; then go back to the five minims and increase as at first. I have used this for the last ten years in the various stages of chronic pulmonary consumption. I have also used the solution of chloride of gold and soda as recommended by Drs. Shurly and Gibbs, but I very much prefer this. There is no doubt in my mind but it has a direct effect upon the bacilli in the lungs.

This hypodermic injection can be used per rectum in doses of five drops in half an ounce of water, three times a day, increasing one drop a day until thirty drops have been reached. Then go back to the five drops and increase as before.

The rectum must be washed out with tepid salt water before each injection. Administered in this way it will be taken directly into the circulation unaltered.

The two methods can be alternated in any case where it is not feasible to give it either hypodermically or per rectum; commencing with ten drops and increasing up to thirty, and then go back to the original dose as before. This should be given directly after the three principal meals.

All vegetable remedies should be given in infusions when practicable, made from the fresh bark, leaves or roots, and to every pint of the infusion add one grain of salicylic acid and ten drops of chloroform. As the patient is about to drink it, let him put into every ounce one teaspoonful of glycerine.

The infusion should be made every day and drank cold.

Epidermic medication should also be practiced, using as a base either pure lard, coco butter, petrolatum, cod liver oil, or fresh butter, variously combined with resorcin, quinine, aromatic oils and resins.

I will close by giving one case which I had in February, 1883. The symptoms may, I think, be considered as typical, and the treatment shows in a general way my ideas of the manipulation of tuberculosis.

Miss Page, blonde, aged 21. Family history showed the father and mother to have died of tuberculosis, together with a brother and sister and several uncles and aunts on both sides of the house. She had been ailing for three months when I first saw her. Lost considerable flesh, was coughing morning and night. Sputa frothy, pulse 120, temperature 102° in the afternoon. Had slight hæmoptysis. Percussion showed slight dulness over the apex of left lung and rough respiration. There was intercostal neuralgia and general tenderness over the whole chest. Appetite poor, bowels constipated, urine scant, passing about one pint in the twenty-four hours, with specific gravity 1030. The skin was very dry and scurfy.

I began treatment by giving three grains of hydrargyri chloridimite at night, in the morning two drachms of sulphate of soda in a pint of hot water, and one pint of spearmint tea before dinner and supper, and a borax bath in the middle of the afternoon to be followed by inunction made of four ounces of pure lard and one drachm of oil of bergamot, alternating this with an inunction of resorcin one drachm, dilute alcohol two drachms, petrolatum one ounce, oil of gaultharia one drachm. Mix and use as above.

I ordered a suppository at night made of iodoform twelve grains, coco butter three drachms, creosote and oil of cloves of each two drops. This amount makes twelve suppositories.

For inhalation, balsams of Peru and storax, oil of sassafras, of each one ounce, alcohol twelve ounces. Digest six days, filter and add one ounce of chloroform. Make a paper funnel and place in it a wad of absorbent cotton. Put from fifteen to twenty drops of this mixture into it and inhale five minutes every three hours. For the constipation, infusion of rhamnus purshiana, p. r. n.

I gave the following to the patient after meals as an antiseptic tonic:

Chloride of sodium four drachms, chloride of potassium two drachms, corrosive sublimate half a grain, water four ounces. Give one teaspoonful after the three principal meals, in two ounces of water or aromatic tea.

As an appetizer the following was all that could be wished: Extract cannabis indica six grains, extract ignatia two grains, salicin fifteen grains, phosphate of calcium half a drachm. Make into thirty tablets and take one thrice daily.

This not only created an excellent appetite, but kept the bronchial mucous membranes free from undue irritation.

For the high temperature she had the following: Tincture veratrum viride one drachm, hydrocyanic acid, dilute, one drachm, tincture prunus virginica, four ounces (made from the green bark, alcoholic strength one to six), put four ounces of the bark into sixteen ounces of the menstruum, give of this from twenty to thirty drops three times daily, in water, or an aromatic tea.

The diet was rare meat, not less than one pound in the twenty-four hours, and from that up to three pounds, condensed milk, bread made from cream of tartar baking powder, soft boiled rice, infusion of malt (made in the manner described), pineapple juice and orange juice, plenty of nice butter, fresh cream.

The principles of hygiene that I have formulated were fully carried out.

The patient was under my treatment for six months and perfectly recovered, and is now in good health.

A MIXTURE FOR HÆMOPTYSIS.

Bamberger is said to have approved of the following mixture in hæmoptysis:

- R. Turpentine, āā 3 j.
Oil of sweet almonds, āā 3 j.
Mucilage of acacia, āā 3 iv.
Simple syrup, āā 3 iv.
Distilled water, 3 v. mḡ .

One teaspoonful of this mixture may be given every half-hour.

INSTINCT IN ANIMALS AND INTELLIGENCE IN MAN CONTRASTED.

WITH AN EXAMINATION OF DARWIN'S DICTUM OF THE "MISSING LINK" AND LINNÆUS' DOGMA "NATURA NON FACIT SALTUS," WITH A FEW ORIGINAL OBSERVATIONS THEREON.

Read by Title in the Section of Medicine and Physiology at the Forty-Second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5, 1891.

BY WILLIAM W. PARKER, M.D.,
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Instinct in animals is a matter of daily observation by every class of mind, and has always been a subject of great interest, nevertheless it seems still little understood. Writers in psychology are not yet agreed even upon its definition.

Ribot, a modern French writer, says it embraces "all those psychological phenomena occurring in animals, and all forms of mental activity, inferior to those in men." A German contemporary says "It is an act conformed to an end, but without consciousness of that end." Darwin's definition is more elaborate, but scarcely more definite; by reason of its length it is more open to criticism. He says "Instinct is an action which we otherwise would require experience to perform, when performed by an animal, more especially by a very young one, without any experience, and when performed by many individuals in the same way without their knowing for what purpose it is performed." This definition is certainly at fault when it claims that actions under the direction of instinct are performed "without knowing for what purpose they are performed." The dog that went once a week many miles to market alone certainly knew for what purpose he went there. The horses in Richmond that quicken their pace at midday when their heads are turned towards their stables, know why they prefer to go in that direction.

It may be impossible in a few set phrases, however carefully considered, to differentiate clearly human intelligence from what we call animal instinct. Their manifestations are so varied and numerous, and so interlocked, that like the lights and shadows in the landscape we cannot say where the line of separation really begins.

Why there should be such reluctance among modern writers in granting intelligence to animals is rather hard to say. The analogy in anatomy and physiology of man and the lower animals is very remarkable. The laws of digestion, assimilation, circulation, etc., are very much the same. We endeavor by vivisection to unravel the mysteries of digestion or indigestion in man.

In the brain of the animal we see analogy in structure; why may not there be analogy in function?

But to return. It seems to me sufficiently defi-