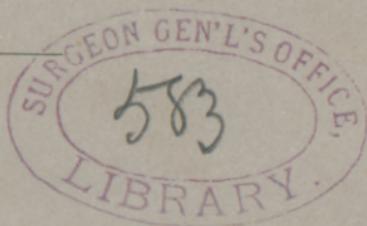


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PATIENTS.

BY
SIMON BARUCH, M.D.,
OF NEW YORK.



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THE MANAGEMENT OF PNEUMONIA PATIENTS.¹

BY SIMON BARUCH, M.D.,
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My chief reason for bringing so trite a subject before you is that the fatality of pneumonia and the frequency of the discussion of its treatment indicate that it is very far from being settled in the minds of the profession. Another reason is a desire to summarize a personal experience extending over one-third of a century in city and country, private and hospital practice, and which represents a therapeutic evolution, a consideration of which may contribute an humble stone to that therapeutic structure which can be reared only by the aggregation of individual observations. It is hoped that the discussion of this subject to-night may furnish some clue to a better management of patients suffering from this very prevalent and fatal malady. The most effective therapeutics may be evolved only from the most thorough comprehension of the nature of disease. Whether stumbling upon it accidentally, as in the case of quinin for malarial diseases, or by a gradual evolution, as in the Brand bath for typhoid fever, or by a process of reasoning, as in the thyroid-gland treatment for myxedema, our therapeutic achievements are in proportion to our mastery of the nature of the disease.

The history of pneumonia illustrates this idea. I will not weary you with the recital of its historical

¹ Read before the New York Academy of Medicine, December 3, 1896.



stages, but confine myself to personal observations. The teaching of the schools and text-books in 1859-'62, and the practice in the military hospitals in which I served as interne, were clearly antiphlogistic, because the conception of lobar pneumonia at that time was a pure inflammation of the lung, whose tendency was to destroy life by apnea (Watson). Delirium, pyrexia, and other threatening manifestations were regarded as "direct evidence that the pectoral mischief is telling through the circulation of venous blood through the brain." It was but a legitimate deduction from this view that the chief agents to bring about recovery were the so-called antiphlogistics, by which it was hoped to throttle the local disease. It would be a bootless task to review the contending opinions prevailing before and at the time mentioned. Long before this period Dietl of Vienna had learned from the homeopaths (who were genuine Hahnemannians, and not the mongrel breed met with to-day) that pneumonia is a self-limited disease, tending to terminate favorably if the patient's vital forces be not despoiled by blood-letting, mercurials, and starvation.

Although he combated the prevailing "hematomania" with energy, he failed to make any permanent impression. In the first decennium of my active practice, Hughes Bennet and Austin Flint labored to inculcate similar doctrines. Their efforts were more successful, because the medical profession was beginning to emancipate itself from the thralldom into which that bloodthirsty monster phlogosis had cast them. In Vienna, a therapeutic nihilism attained ascendancy, which, though not as fatal, did

not fill the full measure of the physician's duty. Then came the quinin, aconite, and digitalis, and, later, the antipyretic era, from which the profession has not yet quite emancipated itself.

We stand to-day on the threshold of a view of croupous pneumonia which will contribute more to the saving of lives than all the doctrines and remedies suggested since the days of Hippocrates. The student is no longer taught, as I was taught, that the pneumonia patient dies from apnea. Heart failure is the specter that now stands at the bedside of the patient in this and, for that matter, in most other acute diseases. But we are, fortunately, not lapsing into the Brunonian theory of asthenia, which demanded enormous quantities of alcoholic and other stimulants. To-day it is an almost universal axiom in the therapeutics of croupous pneumonia to prevent and combat heart failure. The view that *this is an infectious disease, whose chief recognizable lesion is in the lungs, but whose lethal tendency is in the overwhelming of systemic force and vigor*, is obtaining more and more recognition.

I would go further than this, even. Careful clinical observation and a judicious sifting of the testimony of reliable practitioners have brought us to the belief that croupous pneumonia is no more a lung disease than is typhoid fever a bowel disease. Whenever this doctrine shall receive universal acceptance, we will cease to *treat the disease*, and we shall be prepared for a more effective management of patients suffering from it.

It may be said that this idea is obtaining adherents in certain quarters. All of our recent text-books in-

sist upon maintaining the patient's vital powers as the main indication. That great American clinician, Austin Flint, read a paper before the State Medical Society in 1877, on "Pneumonic Fever," in which he referred to the analogy to typhoid fever. My interest being aroused, I discovered that, 200 years ago, Huxham had insisted upon the infectious character of pneumonia. Thus history has repeated itself in this as in other diseases, *before* the microorganisms assigned to them had been discovered.

As to *etiology*: The present state of our knowledge may be briefly stated to be, that while cold may be a predisposing factor which diminishes the patient's resisting power, the Sternberg-Fraenkel diplococcus is an important factor in the production of croupous pneumonia, because it is present in about seventy-five per cent. of cases, although in some cases there are doubtless other organisms present. Sternberg and others have found the diplococcus in the mouths of healthy persons. Its mode of entrance into the lung and its pathogenic course are not yet clearly determined; its aspiration from the mouth seems to be claimed by most observers. The presence of some constitutional depression is a potent etiological factor. Age is a predisposing and exempting factor, inasmuch as young children are rarely attacked; while it is most prevalent among adults, and liability to it diminishes with advancing years.

Typhoid fever presents analogous conditions. The Eberth bacillus enters through the mouth and is lodged and developed in Peyer's glands. The chief differences are that the Eberth bacillus is not, like

the diplococcus, capable of producing other diseases, and that the life period of the former is three to four weeks, while that of the latter is five to ten days. The analogy certainly holds with regard to the influence of depreciated constitution and age as etiological factors.

Analogy in Symptoms.—In pneumonia we have an increased leucocytosis, pyrexia, and more or less overwhelming of the nervous system, which is reflected to the heart, lungs, and other organs. The dyspnea is, I believe, more the expression of a special toxemia than of the crippling of the lung, because it is not always in proportion to the extent of the lesion, and it disappears at the crisis, while the lung is still greatly obstructed by the exudates. In addition, we have cough, which of course is due to the disturbance of the lungs and bronchi.

We have practically the same manifestations in typhoid fever, differing only in regard to the habitat of the microorganism, diarrhea taking the place of cough. The fever runs a different course because of the difference in the life-period of the organisms involved in each disease.

The most striking and important similarity is that the chief point of attack, in both diseases, is upon the nervous system; the toxemia resulting from the life and death of the microorganisms spends its chief force upon the nerve centers. This explains the well-recognized clinical fact that the general symptoms are rarely a correct index to the local lesion. Dyspnea and fever, especially, may be extreme, and the case may terminate fatally, with slight involvement of the lung, just as we may observe the most serious

general condition, in typhoid, without evidences of local lesion.

Crisis in croupous pneumonia is signalized by complete cessation of all the general symptoms, because the life-period of the microorganisms is terminated. And yet the lung remains more or less solidified by exudates, as is evident from the physical signs continuing. So do the general symptoms of typhoid fever cease with the cessation of the life-period of the Eberth bacillus, although the intestinal lesions are still so far from being removed that great care needs to be exercised with regard to diet, rest, and other preventive measures.

The *prognosis* of croupous pneumonia and typhoid fever bears close resemblance in many respects. The effect of previous mode of life, habits, and environment, before and during the illness, upon the issue of the case, is very much alike in both diseases, as is the influence of childhood upon the prognosis.

Having as briefly as possible in the time at my disposal traced the close analogy in the etiology, symptoms, and prognosis of these diseases, I propose to deduce from this analogy the expediency of following in pneumonia, as nearly as the differences indicated above may admit, the line of management which has afforded the best results in typhoid. We have learned from sad experience that the chief indication in typhoid fever is to enhance the patient's resisting capacity to the lethal agencies evolved by the infection-process.

It is my aim to emphasize a similar cause of action in pneumonia. The management of the pneumonic patient, which I propose to present to your

consideration, is the result of an evolution from the methods, which some of you, like myself, have been taught, and which, doubtless, some of you, as I, have practised for years.

A distinct mental picture of my first case of croupous pneumonia rises before me. The patient was a young soldier, a hardy mountaineer, in whom a large portion of the right lung was consolidated. The chief surgeon of the hospital directed, as was the custom in 1862, flax-seed poultices to the chest, and a mercurial purgative, to be followed by nitrous powders, a preparation which is happily unknown to our recently graduated colleagues, consisting of 8 grains of nitrate of potassium with $\frac{1}{2}$ grain of calomel and $\frac{1}{8}$ grain of tartarized antimony, these powders to be administered every three hours until the gums were touched; *i. e.*, until ptyalism ensued. Wet cups to the chest were added to emphasize the doctors' blows upon the enemy—inflammation of the lungs—with a view to deplete the latter. The inflammation was resolving beautifully when the left lung was attacked. The same treatment was resorted to, with the exception of a blister being substituted for the wet cupping as a concession to the evidently enfeebled condition of the patient. This lung also was beginning to resolve, but the vital powers had been so exhausted by the depleting measures, that the system was unable to furnish the necessary conditions for restoration. The result was that the disease was practically cured, but the patient died from sheer depletion, as evidenced by a necrotic gray deposit on the blistered surface.

This result of what was the classical treatment at that time (1862), made a deep impression on my

youthful mind as a crucial test, and I say it with some satisfaction that no patient of mine has ever been salivated or cupped, and very few blistered since that time. I continued for a long time to commence the treatment with a mercurial purge, to give veratrum to reduce the pulse, to poultice the chest for comfort to the patient, and to give small doses of tartar emetic as an expectorant, and morphin to allay the cough. But the teachings of Hughes Bennet Austin Flint, and Horatio C. Wood, gradually weaned me from this mildly spoliative practice. Until a few years ago I felt as helpless in a case of pneumonia as I did at that time in typhoid fever. Recovery in both diseases seemed to be the result of conditions over which my control was feeble or lacking. The patient's constitution, the type of the disease, and his environment played the chief rôle. Treatment was symptomatic in both diseases—expectant it was termed—and not inaptly, for I always expected something to happen which I seemed powerless to prevent. When I learned the true principles and value of the Brand method in typhoid fever, a positive treatment was at my command by which, *if called early*, serious and fatal complications, against which I had formerly felt impotent, could be prevented. For the comfort and the sense of security derived from this method, since I mastered its technic, I shall ever be grateful to its author. And herein I was recently corroborated by Gilman Thompson, Delafield, Ball, and Northrup in the "Section of Practice."¹

It has been my ardent desire to reach a similarly

¹ *Med. Record*, November 7, 1896.

comforting attitude in pneumonia. Weary of the expectant plan, and observing its enormous fatality, especially in those depreciated by faulty modes of life and habits, I looked to hydrotherapy for succor. While I cannot say that the latter has been reached to an entirely satisfactory degree, observation and reflection have produced a method of management whose clinical value deserves to be tested further.

The prevailing type of the disease should be carefully considered. It has been demonstrated by careful observers that the vaunted success of certain methods of treatment may be attributed to a change of type in the disease and the previous conditions of the patient. Any new treatment should therefore be approached with caution and judgment.

Dr. Leaming, whom many of you remember as a practical, safe clinician, gives a graphic delineation of this idea in his little book published in 1884.

“When I began my professional career, I believed, as I had been taught, that active interference was necessary in every step of this disease, to prevent destructive inflammation. But I soon found, and by accident, that cases would get well without active treatment; that the expectant plan and wise management was the best; simple medication, with stimulants and supporting alimentation. The mortality was so small that it seemed unnecessary for an uncomplicated case to reach a fatal result. When the fatal form of pneumonia began to occur in New York, I, with other physicians, was surprised at the failure of the managing method. The failure of the latter rendered a resort to the heroic method a necessity.”

The type of pneumonia in this city appears to have remained as grave as it was in the time of which Leaming wrote. We still see and hear of cases dying rapidly. As recent sad illustrations in our own ranks may be cited the deaths of the lamented Loomis and of the brilliant young clinician Roosevelt. *In hospital and private practice this disease is more fatal than any other acute disease of adults.* In the New York City Board of Health statistics it ranks next to phthisis in fatality. I apprehend that the chief reason of this great fatality may be sought for and found in the helplessness of physicians in the presence of this fearful disease.

It follows, therefore, that the first consideration in the management of these cases is a due regard for the prevailing type.

Complete rest of body and mind, and good nursing, are essentials in furthering recovery. This cannot be too earnestly urged upon the patient and his family. The ventilation of the sick-room, too, which is much opposed by the laity, should be anxiously watched by the medical attendant, who is too prone to yield to existing prejudices, and thus to become an unwilling accomplice in depriving the patient of this greatest pabulum in infectious diseases—fresh, pure air. The patient and family should be positively assured that there is no danger of taking cold if the body temperature is elevated to any considerable extent. In summer and winter the air of the sick-room should be constantly renewed, even at the cost of reducing its temperature in winter to an extent which may be uncomfortable to the nurses. During the late war, cases of pneumonia

treated in tents in rigorous weather did far better than those treated in improvised hospital buildings.

The diet should be restricted to milk and farinaceous broths, administered with precision, while the patient is awake, every two hours, in quantities ranging from four to eight ounces. I do not share the horror of asthenia in this disease, which is only too prevalent, and leads to undue feeding. The disease is of short duration; it not infrequently suddenly attacks well-nourished persons in the midst of comparative good health. It seems an unphysiological proceeding to stuff these patients with concentrated foods, in large quantities, which they cannot assimilate, and thus to impose an additional tax upon the system. Stimulants, also, are rarely so necessary to the same extent as formerly, since the course of management here outlined was adopted. In alcoholic subjects whose consumption of liquor has been a daily habit and requirement, $\frac{1}{2}$ to 2 ounces of good whisky every two or three hours may be useful, especially while resolution is going on, but not as a spur to a failing heart, as is commonly the practice. I am not quite sure on this point, hence still feel myself under the dominion of this idea. It would seem that inasmuch as a large part of alcohol is eliminated through the lungs, the latter are needlessly overburdened while they are straining to the utmost their functionary capacity. I should like to hear the experience of the fellows of the Academy upon this point.

Of medicinal agents I use but very few. Besides an opening dose of 10 to 20 grains of calomel, strychnin, and an occasional dose of morphin for

pain, are the only medicines I have found of any real value. When the first sound of the heart becomes muffled or feeble, hypodermics of strychnin, $\frac{1}{30}$ to $\frac{1}{10}$ gr., every three or four hours, offer a valuable aid to tide the patient over a trying period. Given even to the production of trismus, if necessary, it is far superior to digitalis or brandy. I do not fear an occasional dose of phenacetin when the patient is restless, with high temperature, but it should not become a routine practice for temperature reduction. It is rarely required. Quinin, aconite, veratrum, digitalis, and other drugs, I have discarded after a prolonged trial.

The administration of calomel requires some detail. It should be placed, as Leaming and Cammann direct, dry upon the tongue and allowed to gradually disappear, being swallowed with the saliva, or, if necessary, washed down with a small quantity of water. These experienced practitioners tell us that “the inefficiency of the expectant method rendered a resort to the heroic a necessity, and with very encouraging results. Cases, such as had proved fatal by the mild treatment, were saved by the prompt exhibition of sedative doses of calomel, which are less depressing to the system than smaller doses.” Today we are able to give a more rational explanation of the action of calomel in pneumonia than that of a “sedative.” Its effect is twofold. First, it is a fact clearly established by Sternberg and others, that the diplococcus of Fraenkel, found most abundantly in the saliva, is destroyed by very feeble mercurial solutions. This may explain why the effect of calomel is so much more striking when allowed to slowly mingle

with the saliva. Thus, the supply of microorganisms is at once cut off, together with toxins which would continue to be evolved from these, so long as they are living. This is not an unreasonable explanation of the remarkably rapid change in the symptoms of even desperate cases which are reported by Leaming, and which I have observed.

Secondly, a large dose of calomel removes ptomaines that may have lodged in the gastrointestinal canal. Calomel is the only agent to which investigations (made before guaiacol was discovered) have conceded internal antiseptic properties. Moreover, it clears the *primæ viæ*, as we older practitioners were taught to do; it clears the ship for action, as it were. It also disgorges the portal circulation, and probably thus relieves the stasis existing in the pulmonary circulation indirectly. Be the explanation what it may, clinical observation in typhoid fever, pneumonia, tonsillitis, diphtheria, and other infectious diseases has convinced me of its value when given in one large dose in the beginning of the case. It very rarely produces serious purgation. Even when diarrhea exists, it does not salivate as readily as smaller doses, and it certainly requires no repetition. It is more easily retained by an irritable stomach than other medicines. It is my custom to direct the patient to rinse the mouth frequently with a saturated solution of potassium chlorate to insure against ptyalism, and to keep the mouth in a clean condition. Juergensen recommends weak mercurial solutions as a mouth-wash for the purpose of destroying the diplococci, whose favorite habitat is in the mouth.

Hydrotherapy, judiciously adapted to the indica-

tions of the case, has proven a valuable auxiliary in the management of these patients. In the croupous pneumonia of children, who are more easily handled, without great disturbance, the tub-bath is very useful when administered alongside of the bed, as in typhoid fever. The temperature should, however, rarely be below 85° F. Beginning with 95° , each bath may be reduced a few degrees, until the patient becomes accustomed to it, repeating every four hours until the temperature remains below 102.5° . Friction is a *sine qua non*, because chilling is more apt to occur in these patients than in typhoid fever, and for this reason the duration of the bath should be short—eight to ten minutes. The toxic agents which are operative in pneumonia appear to affect the heat-center quite differently from those evolved in typhoid fever. A bath of 80° F. often reduces the temperature in the former disease two to four degrees, while in the latter one degree would be a large reduction. Upon this clinical fact I have based a diagnostic bath which materially aids in the differentiation of typhoid fever from other diseases which so strongly resemble it during the first week. The value of the full bath in the pneumonia of children has been confirmed by the highest authorities, such as Penzoldt and Baginsky in Germany, Hutinel of Paris, our own Jacobi, and others.

In adults, however, I have given up tub-baths, although very cold baths (50° – 60° F.) have been lauded by Juergensen and commended (65° F.) by chief-surgeon Vogl of Munich in a letter to myself. While they proved useful in many cases, I am convinced that the disturbance and agitation incident to a cold

tub-bath increase the lung disturbance. If the patient is very dull, cyanotic, and presents great nerve prostration, resembling the typhoid state, I do not hesitate to choose between the two evils, an increase of the local disturbance and a decrease of nerve prostration, by plunging the patient into a bath of 80° F., or less, or seating him in water at 100° and pouring several basins of water at 65° to 75° F. over his head and shoulders. This is a valuable heart tonic. It serves, by deepening the inspirations, to dislodge accumulations in the bronchi, which have crippled the healthy as well as the affected lung.

The most useful hydriatric procedure in pneumonia is the *wet compress*. This consists of three folds of thin old linen stitched together at the edges, which has slits corresponding to the axillæ, so that it may be wrapped around the patient's chest snugly. The slits are made sufficiently deep to allow the upper edge of the compress to reach above the clavicles, and admit of the junction of the flaps thus formed on each side to cover the shoulders. Two such jackets, and two pieces of closely woven thin flannel of the same shape, but an inch wider and longer, should be provided and fitted to the patient. One of the former is rolled up and soaked in a basin of water at 60° F., and wrung out so that it remains quite damp without dripping. The flannel is now spread out upon an even surface and the wet compress put upon it, so that there remains an edge of flannel about an inch wide all around. Both are rolled together half-way. While the patient is gently turned upon his left side, with the precaution of not allowing any exertion on his part, the compress is so placed upon the bed that the

rolled part lies in close proximity to the left side of the patient, and the lower edge of the left slit is under the left axilla. Now the patient is quietly turned upon his back, so as to release the rolled-up portion. The latter is now unrolled, and both edges of the compress are brought forward upon the front of the chest and are thus made to envelop the latter snugly. The flannel cover, which has been allowed to lie upon the bed during the application of the wet compress, is now brought forward so as to quite cover the latter. It is secured by two safety-pins in front, and one upon each shoulder.

The well-known oiled silk jacket may serve as a model for the shape and manner of applying this wet compress. The latter should be changed every half-hour, unless the patient's temperature is below 102.5° F.; every hour unless it be 99.5° F., when it is discontinued. The removal is accomplished by preparing the second compress just like the first, paying attention to the water temperature being 60° F. When it and the flannel covering are rolled up in readiness, the first compress is removed and the second is applied. Thus a rotation is kept up every half-hour or hour as the case may require, night and day, unless the patient be asleep. The water in the basin should be renewed each time, and the compress rinsed off in another basin before it is rolled up for soaking, in order to insure thorough cleanliness and prevent furnuncles by furthering asepsis.

The technic of the procedure has been entered into with a detail that may seem needless. As will be shown later, these details insure precision, and upon their exact execution may depend success or failure.

The physician should himself supervise the first application, just as he should supervise the first Brand bath in typhoid fever. A skilled nurse can apply these compresses with a minimum of disturbance.

There is need, too, of individualization. In the average case a temperature of 60° F. will be appropriate. Should the patient evince stupor or muttering delirium, a lower temperature should be adopted, and the chest should receive one or more dashes of colder water, before renewal of each compress. The same procedure is useful in bronchopneumonia, when the bronchi are blocked by secretions, or cyanosis exists. In a case which I had the privilege of seeing with Dr. E. J. Ware, this application proved its worth. The patient had passed through an attack of typhoid fever lasting some ten weeks; her condition was so precarious that when I entered an adjoining room she was bidding her relatives adieu. By skilful management she had been sustained up to this time. The right lung in its entire posterior aspect was solidified. The temperature was usually below 102° F., and the pulse exceedingly rapid. There was no dyspnea.

In this case the modified procedure referred to was extremely valuable. Inspiration soon deepened, the heart slowed, and in a few days the patient rallied from a most desperate condition.

A higher temperature than 60° F. may be used if there be much jactitation, insomnia, or excitability. In the latter event great benefit will accrue from allowing the compress to remain two hours and moistening it more thoroughly, which converts the compress into a soothing fomentation that is not relaxing like a poultice.

In a colleague, whom I had the privilege of seeing with Dr. Palmer Cole, there was complete involvement of the entire right lung, with temperature ranging from 103° to 105° F., the heart action being fair. The patient being a morphin *habitué*, there was a decided neurotic element in the case, involving insomnia and great jactitation. The compresses were only applied hourly, despite the high temperature, but they were allowed to be quite moist, in order to obtain a calming effect. Although the left lung became involved later, Dr. Cole informed me that the patient recovered from his desperate condition, and that, in his opinion, his life was saved by the management here outlined. No remedial measure deserves adoption by the profession unless the *rationale* can be satisfactorily explained.

According to my view of pneumonia crouposa, the therapeutic indications are (1) to stimulate and invigorate the nerve centers with a view to enhancing the patient's vital powers, (2) to prevent and control heart failure, (3) to reduce temperature, (4) to eliminate toxins.

The nerve centers are well stimulated and rehabilitated by the repeated gentle shocks and subsequent reactive stimulation of the sensory fibers in the skin, both of which are conveyed to the central nervous system and thence reflected to the organs, upon whose functioning capacity depends the patient's ability to resist the toxic agencies circulating in the blood. We aim here to accomplish precisely the same object as with the Brand bath in typhoid fever. The milder form of shock is better adapted to pneumonia, because it is less disturbing, and because the toxemia, induced by the diplococcus, is less intense in the

average case, and certainly has only one-third of the life period of the Eberth bacillus.

After a few compresses the patient grows more calm, the inspirations, which are deepened by each application, continue deeper, dyspnea is markedly relieved, sleep ensues, appetite improves, and the skin and kidneys begin to act more freely. These clinical evidences demonstrate the correctness of the *rationale* enunciated above.

The maintenance of the heart action is accomplished by the wet compresses in the following manner: When the cold compress is applied, there is a rapid contraction of the cutaneous vessels, which raises the tension at once, but gives way to a tonic dilatation of these vessels, which is evidenced by a ruddy hue of the skin. This dilatation differs very decidedly from that relaxed condition of the cutaneous vessels produced by warm poultices. The latter relax the vaso-constrictors, producing a paretic condition of the vessels, or a stasis, while cold applications stimulate the vaso-dilators, giving rise to an active dilatation, with maintenance of the tone of the vessels, an active hyperemia, by reason of which the blood is propelled more vigorously through them. The heart is thus relieved; not by a *vis-a-tergo*, as is the case after digitalis, but by a *vis-a-fronte*, formed by broadening of the blood-stream in the cutaneous capillaries, whose enhanced tonicity aid at the same time in propelling the blood onward. Arterial tension is increased, as is evidenced by the better filling of the radial arteries. The right heart is indirectly aided by this enhancement of the general tone in the vascular apparatus, and may thus

expend more force upon the pulmonary circulation, whose vessels contract more firmly by reason of the dilatation of the superficial vessels.

Romberg¹ has recently confirmed what I have, several years ago, and repeatedly since that time, insisted upon, that in acute infectious diseases we encounter disturbances of the circulation which manifest themselves clinically as reduced tension and diminished filling of the arteries, and which are commonly described as heart failure. Undoubtedly the condition of the peripheral vessels bears a very large share in the production of cardiac atony, as I have sought to impress when explaining the *rationale* of cold applications in typhoid fever and pneumonia.² Romberg has shown by experiments with injections into rabbits of Fraenkel's diplococci that the circulation is damaged by a paralysis of the vasomotors, while the heart itself remains unaffected. It is true that the right ventricle is overloaded because of lung infiltration, but that this does not so seriously cripple the heart as is generally supposed is proved by the fact, referred to above, that when crisis ensues, the compression due to the exudates is not removed at once, and yet the respiration and circulation are relieved as if by magic. This can only be accounted for, if I may be allowed to reiterate so important a statement, by the nervous system being suddenly relieved of the toxic elements generated by the diplococcus, whose activity ceases at once when it has reached the end of its natural life-period. It is probable that crisis ensues when the antitoxins evolved in

¹ *Berlin klin. Wochenschrift*, 1895, Nos. 51 and 52.

² "Uses of Water," vol. ii, p. 166.

the natural course of the disease have attained an overbalance of power. The battle between the diplococcus, with its allies, and the patient's vital powers, is at an end. The most important effect of cold applications in pneumonia is, therefore, the aid and sustenance they furnish to the nervous system, which bears the brunt of the fight. The improvement of cardiac action is one of the results of this effect.

Reduction of temperature is an important therapeutic element in these cases. Persistent high temperature may enfeeble the heart, and certainly depreciates the nerve centers. Some good clinicians, like Juergensen, claim that high temperature is the chief danger to patients suffering from pneumonia, and he advises in his latest work¹ that very cold baths, some below 60° F., are demanded to meet this "great danger." I shall not discuss this doctrine fully to-night. Since my argument against it before the New York State Medical Society in 1889, I have repeatedly expressed adverse views in this and other societies to this unfortunately too firmly established error, an error which has given unhappy prominence to the coal-tar antipyretics in the therapy of fevers. If any further testimony is needed to lay this ghost, which has so long affrighted timid practitioners, to rest, the discussion on fever in the Fourteenth Congress of Internal Medicine in April, 1896, demonstrates that we should cease to regard elevation of temperature as the cardinal symptom for therapeutic attack. While, however, these conclusions fully corroborate my own views expressed eight years ago, I may say that high temperature, though not actually

¹ Penzoldt and Stinzing, "Allgemeine Therapie," 1896.

and directly a lethal factor by inducing fatty degeneration of the cardiac muscular fiber, as claimed by Ziegler and others, does seriously cripple the work of the heart by imposing upon it more rapid action, and it does seriously interfere with the patient's comfort. High temperature, therefore, demands careful attention by measures that are not harmful like the routine use of coal-tar antipyretics. As I said elsewhere, I do not hesitate to use the latter occasionally when high temperature is associated with sleeplessness or great jactitation. They give great comfort to the patient, and are less annoying and disturbing than the wet compresses. But the latter are not used by me for their antithermic effect, which is only incidental.

The susceptibility of pneumonia patients to cold baths, and the great facility with which their temperature may be reduced, renders great care in the application of these measures imperative. For this reason I have abandoned cold baths, and have dwelt so minutely upon the method of application. That so mild a procedure as the wet compresses should be capable of reducing high temperatures in pneumonia, I have numerous charts to demonstrate. The decline is not as rapid as after cold baths, but it is pronounced and steady. It does not ensue after one or more compresses, nor does it follow the course of temperature reduction observed after cold baths in typhoid fever.

It decreases day by day one or more degrees. It is not the result of direct refrigeration; such an effect is neither aimed at nor obtainable. When a compress at 60° F. covered with flannel is applied around the chest of a pneumonia patient who presents a

temperature of 102° to 106° F., there is an immediate cooling of the surface covered by it, which is followed by a gradual reaction with a more or less rapid rise of the surface temperature, until the latter is nearly the same as it was previous to the application. The surface is now bathed in a vapor produced by the heating of the compress. If the latter be allowed to remain sufficiently long, the flannel covering receives the vaporized water, and passes it outward until the compress becomes dry. But if the compress is changed as indicated above, the vapor is more slowly removed, and the skin and compress are found to be cooler than the flannel covering. Thus the gradual cooling process is continued until a fresh, cold compress is applied, when the skin, more sensitive by reason of having been bathed in this warm vapor, feels the shock more distinctly and reacts more fully. The error is not infrequently committed of covering a wet compress with oiled silk. While this would protect the bed and clothing of the patient, it would defeat the object of the compress by converting it into a poultice. If the body temperature is 103° F. or over, the compress applied as above becomes warm in half an hour, although evaporation of the moisture through the flannel renders the skin under it cooler than other parts of the body. When it is renewed, the repetition of the gentle shock and tonic dilatation occurs. Thus a slow cooling process, not relaxing or in any way depreciating, is maintained, which gradually lowers the general temperature, calms the patient, and contributes much to his recovery.

How far this cutaneous hyperemia acts as a revul-

sive, it is impossible to ascertain, but it is a well-known fact that such hyperemia is always accompanied by contraction of the blood-vessels in the parts underlying. Thus may a favorable effect be produced also upon the inflamed lung tissue, and its circulation be improved.

The elimination of toxins is promoted by the wet compress, as by all cold hydriatric procedures. It has been proved by Roque and Weil that the urotoxic coefficient of the urine is trebled after cold baths in typhoid fever. All the secretions of the body are increased by cold applications. The alkalinity of the blood is also enhanced by the latter, as demonstrated by Alois Strasser. Tassinari (quoted by Winternitz) says that after septic infection of rabbits, the alkalinity of the blood is reduced about one-half. And it has been shown by others that in all infectious diseases the blood is less alkaline. Since alkalinity of the blood is a prerequisite for the existence and activity of phagocytes, it is not unreasonable to assume that cold applications further the phagocytosis, and elimination of toxic products, by rendering the blood more alkaline. Hence Buchner is correct (as Winternitz claims) in asserting that by cold-water treatment the powers of resistance to infectious agencies are enhanced.

This antitoxic-eliminating effect is increased by copious libations of water. It is my custom to administer in pneumonia, as in typhoid fever, 6 ounces of water every two hours, alternating with the same quantity of milk, night and day, when the patient is awake. The enormous increase of urine is scarcely credible. I have charts showing from 60 to 122

ounces in twenty-four hours. Some of the well-trained nurses, who have seen much hospital service, have volunteered an assurance of the correctness of their reports, under the impression that I would discredit such large quantities.

There is a striking peculiarity impressed upon the regular course of croupous pneumonia by the method here outlined to which I desire to call attention. Although the fever, dyspnea, and other distressing manifestations yield, to a remarkable extent, in a large proportion of cases, in one or two days, the physical signs do not change in a proportionate degree. Indeed, I have observed a distinct crisis in only about forty per cent. of the cases so treated; in the remainder, the disease ended by lysis of a very slow type. Improvement of the general symptoms goes on, the patient seems well, and is anxious to rise, but a dull percussion-note, muffled breath-sounds, and bronchial whisper bear testimony to lingering exudates for many days.

As an example, I may cite the case of H. E., who sickened on December 8, 1895. His temperature ranged from 102° to 104° F. for four days, without any pronounced physical signs in the lungs, which were examined every day. On December 12th, consolidation of the entire posterior lower half of the right lung was made out. The mouth temperature was 104° F. at three P. M.; cough had been distressing several days; there were now rusty sputum and increased dyspnea. The family being greatly alarmed, Dr. A. A. Smith was called in consultation, but did not see the patient until the next morning. Calomel having been administered, the wet compresses were now applied, with the effect of bringing the temperature down two degrees in five hours. During the night,

the compresses were, by a misunderstanding of the nurse, renewed every hour. The patient sleeping soundly for the first time since his illness, complained to me of the frequent disturbance. After twelve compresses, the temperature was 101° F. at eight A.M. When Dr. Smith saw him, at ten o'clock, he found him so comfortable that he expressed surprise at being called, and concurred in the treatment. Physical signs of consolidation were distinct. There had been no other treatment except 5 drops of dilute hydrochloric acid every two hours, as a placebo, followed by 6 ounces of water. Temperature reached normal point once every day for two days, and remained normal for ten days, when the patient was dismissed. Physical signs continued during Dr. Smith's attendance of five days, and dulness of the percussion-note had not entirely cleared up when I last saw him.

Clinical results confirm the *rationale* of this treatment, and attest its value. A quarter of a century ago the greatest living German clinician, Professor Niemeyer said: ¹ "I have made extensive employment of cold in the treatment of pneumonia, and, relying upon a large number of very favorable results, can recommend the procedure. In all cases, I cover the chest of the patient, and the affected side in particular, with cloths, which have been dipped in cold water, and well wrung out. . . . In the hospital at Prague, every pneumonia is treated with cold compresses and, according to the statement of Smoler, it is exceptional for a patient not to feel material relief from the treatment."

Why has a treatment which has received high com-

¹ "Text-book of Practical Medicine," vol. i, p. 185, translated by Humphreys and Hackley.

mentation by so eminent a teacher not become an established practice in a disease which so often baffles the physician under other management?

To the student of the history of hydrotherapy this question is not difficult. Although water is an orthodox remedy, to which Hippocrates devoted almost an entire book, and although it has been highly commended by eminent physicians at various times, it has not become the common property of the profession, because most of those who taught its use and value most earnestly failed to give definite directions for its application. Niemeyer illustrates this point. He simply advises "cloths wrung out of cold water to be applied to the chest" of the pneumonic patient. The temperature of the water, the duration, technic, frequency of repetition are left to the discretion and good or bad judgment of his hearers and readers, and yet these are far more important in hydrotherapy than are the dose, time of administration, frequency, etc., in prescribing medicinal agents.

In a paper on pneumonia, published several years ago by an eminent American teacher, the following sentence occurs: "If the temperature in pneumonia rises to 104° , 105° , or 106° F., I use cold baths or "cold packs." Such indefiniteness is to be greatly deprecated when coming from one who is highly regarded as a teacher and guide. A cold bath, without stated temperature, is generally understood to be a bath to which neither hot water nor ice has been added. Such a bath would have a temperature of 75° F. in August, and 45° F. in December, in this city. Thirty degrees in the temperature of a bath are capable of producing an immense difference for good

or evil; in pneumonia it would react very unfavorably, according to my personal observation. Just as Niemeyer failed to create a permanent following for the practice which he so highly lauded, so has the justly famous teacher referred to failed to impress upon the profession a practice which he had taught in 1870, as follows: "If there be anything I should rely on in pneumonia, if the temperature is very high, it is "cold-water treatment." If this excellent teacher had been as explicit in giving temperature, duration, etc., of the "cold-water treatment," as he was in giving the doses of digitalis, nitroglycerin, and camphor, the valuable lessons he endeavored to inculcate would not now (twenty-five years later) require to be taught anew; they would have served as a beacon-light to the vain searcher after reliable therapeutic methods in this fatal disease. Let me emphasize, therefore, that while I may have offered nothing novel or striking in this essay, its chief aim is to impress upon you the great import of giving definite prescriptions for all hydriatric measures in this as in other diseases, be they acute or chronic, for only by such precision may we obtain definite results.

Statistical evidence to prove the value of the measures here advocated, or of any other method of management, is indeed very difficult to produce. The type of the disease differs very much; in private practice the number of cases is too meager, and observations are too inaccurate and unreliable. I may say, however, that I have not lost a case of uncomplicated croupous pneumonia in private practice since the adoption of the management of patients suffering from it, here outlined. In hospital work the chief

element of success with this method, *viz.*, its application in the early stages of pneumonia, is unfortunately absent. Its favorable influence upon the progress of the disease is attested, however, by the statistics of 156 cases in the J. Hood Wright Memorial (formerly Manhattan General) Hospital, in which the total mortality from pneumonia has been reduced one-half, since the method here advocated has been adopted by the entire staff; while in the cases admitted before the fifth day the mortality has been twelve per cent. against thirty-seven per cent. under the formerly prevailing expectant plan. These cases were under the observation and treatment of my colleagues, Drs. Daniels and Knickerbocker, and myself. The method described above is, with slight modifications, equally favorable in catarrhal pneumonia.

The ice-pack method recently advocated by Dr. Mays of Philadelphia, which claims a mortality of 3.58 per cent. in private practice, is worthy of mention in this connection, because its success is applicable upon the theory that it fulfils all the therapeutic indications almost as well as the cold wet compresses. Ice is applied in bags which are wrapped in towels and placed over the affected area, with a view to reduce the inflammatory process in the lung by direct cold. That the latter is an erroneous idea has been proven by the experiments of Silex,¹ who has shown by experiments on animals, that "ice applications increase the temperature of the organs over which they were placed and which were to be cooled." This effect of local cold has long been recognized by hydrothera-

¹ *Münchener mediz. Wochenschrift*, 1893.

pists, who know that intense cold applied externally produces a compensatory hyperemia in the parts beneath, thus protecting the latter against destruction if carried too far. The *rationale* of the favorable influence of the ice-compress treatment, however, is not difficult to explain upon recognized principles of hydrotherapy.

The towels which envelop the bags of ice soon become thoroughly wet by condensation, and thus the application is practically a continuous wet compress. This together with its unevenness prevents the complete reaction which is so useful in arousing the nerve centers, but its being applied upon parts of the chest only prevents serious results from this source. The objection to ice compresses would seem to be their uneven surfaces, which renders them uncomfortable when applied to the posterior portions of the lungs, the patient lying on the back; and also that their weight when applied anteriorly must render them inconvenient. In consideration of these facts I have not felt justified in applying this method of ice packs so long as good results were obtained from the wet compresses.

In conclusion I hope to have shown that

1. Pneumonia is, like typhoid fever, an infectious disease whose chief attack is upon the nervous system, as manifested by heart failure, and other signs.
2. The treatment should be applied, not to the disease, but to the patient, whose resisting capacity should be enhanced by all useful remedial agencies.
3. Calomel in a large dose, followed by wet compresses, adapted in duration and temperature to each case, with fluid diet, and an abundance of water in-

ternally, aided, if need be, by mild alcoholic stimulation and hypodermics of strychnin, offer at the present time the most favorable, yet not perfect, results in the management of patients suffering from pneumonia.

DISCUSSION.

DR. CHARLES B. FOLSOM of Boston opened the discussion. He said that at the Boston City Hospital he had tested the cold-bath treatment in thirty-six cases of pneumonia, all of a severe type. The method consists in placing the patient in a sheet, and rubbing him with a towel and water at a temperature varying from 70° to 95° F., for about ten minutes. The patient is then wrapped in a blanket and allowed to rest for half an hour. Of these thirty-six cases, eight died, a mortality of 22.2 per cent. The mortality in that hospital for croupous pneumonia averaged about thirty-five per cent. Of the fatal cases, one had typhoid fever, one had pleurisy, three were victims of chronic alcoholism, one had general diplococcus infection, as shown by the presence of endocarditis, pericarditis, and cerebral meningitis; one had chronic nephritis, and one had phthisis. As death was only hastened by an intercurrent pneumonia in the case of phthisis, the patient dying on the thirty-first day, and as the case of chronic nephritis was fatal on the second day, these might fairly be excluded. If this were done, the mortality would be 17.6 per cent. He had been convinced from the observation of these cases that the cold baths were very effective, and he was more than satisfied with the results. In marked contrast with the bath treatment of typhoid fever was the fact that all these patients said that the baths were grateful to them. In conclusion, he would say that these baths controlled the fever, diminished the cough, lessened delirium, and induced sleep.

DR. E. G. JANEWAY said that his experience had led

him to dread the afebrile pneumonias of old people more than the highly febrile pneumonias of the young. In the former, neither cold baths or cool compresses had any place; all our efforts must be directed to sustaining the failing strength of the patient. These cases were exceedingly fatal notwithstanding the comparative absence of symptoms. We must look at pneumonia in several different aspects, and must take into consideration, not only the toxemia and the inflammation of the lung, but the individual reaction. Although the prognosis was necessarily very grave in cases in which as much as three lobes were involved, he had seen a number of these cases recover, and in these the treatment had consisted chiefly in the use of oxygen, alcohol, and the so-called cardiac stimulants. Oxygen was of special value when the breathing capacity was markedly diminished, and we could not afford to overlook this fact even though we called pneumonia an infectious disease. Heart stimulants might be required, either early or late, in this disease, and when such a contingency arises as edema of the sound lung, cardiac stimulants must be given hypodermically. He thought the cold compresses made the patients about as comfortable as any other measure, yet he was bound to admit that he had seen a number of pneumonia patients do very well with nothing but a flannel shirt. He was not one of those who believed in decrying the coal-tar series of drugs, simply because a number of physicians, following more particularly the example of the Germans, had observed bad results from their use in unnecessarily large doses. When administered judiciously in proper cases and in moderate doses, they would be found to be of very great value. For example, he had very recently seen a severe case of pneumonia with a temperature of 106° F. The patient had had but little sleep, was slightly delirious, and had a rapid pulse. In this case he had recommended giving five grains of phenacetin, and

repeating it, if necessary, in two hours. As a result of this the temperature remained low for about six hours, and the patient slept well that night. True, the temperature rose the next day to about 105° F., but the next night a dose of six grains of phenacetin was sufficient to secure another good night, and after this the temperature remained low, and the patient made an uninterrupted recovery. He mentioned this case because cold applications had been used to no purpose, while phenacetin had accomplished the desired result. Morphin might have done the same thing, but it would probably have also caused constipation and disturbance of the liver. Our rule in the use of these particular drugs, as with all others, should be to give the smallest dose which will accomplish the desired result. Much had been said about the responsibility of aborting pneumonia. Years ago he had been skeptical about the possibility of calomel doing this, as had been claimed, but since then he had occasionally observed cases which seemed to prove that this might sometimes occur. It was, however, decidedly exceptional. It was right and proper to make an effort to abort the disease, and hence if we saw a case in the chill stage, we should direct that the patient's feet should be kept in a warm bath for half an hour, and that he should be given hot drinks, sweet spirits of niter, liquor ammonii acetatis, and aconite, and subsequently, a large dose of quinin.

DR. W. P. NORTHRUP referred to a case in which he firmly believed that by the use of similar measures at the onset of the first symptoms he had succeeded in preventing the development of a genuine pneumonia. He said that he too had met with many cases of afebrile pneumonia in old people; but he was unable to say much about their treatment, as they had invariably proved fatal. In all cases of pneumonia he was particular about securing an abundant supply of fresh air to the sick room, if necessary, by keeping the patient near an open window. He had

not the slightest fear of these patients catching cold so long as the feet were kept warm, and there was a high fever. He also gave oxygen in pneumonia, but usually, as he had said, by way of the window. He had learned from Dr. Baruch that a bath of 90° F. would often calm a very excitable patient with an alcoholic pneumonia, and would at the same time improve his general condition. He had proved by experience the benefits of hydrotherapy in pneumonia, and believed that in this disease the effect of such treatment could be briefly summed up by saying that it quieted the mental excitement, improved the quality of the pulse, increased the depth of the respirations, and promoted sleep.

DR. ALFRED MEYER said that he had tried the effect of the "digitalis treatment" of pneumonia in his service at Mt. Sinai Hospital, with the result that only two out of twelve patients died. According to the author of this treatment, the daily dose of the drug should be as high as 60 to 120 grains of the digitalis leaves.

DR. BARUCH, in closing the discussion, said that he had not observed any of these cases of pneumonia occurring in old age without fever, and with but few other symptoms. He could not subscribe to the recommendation of oxygen gas, for it seemed to him that according to the law of the diffusion of gases it could not be taken into the system in any quantity. He, however, approved very highly of the principle of this treatment, and made it a point to supply the patient with as much oxygen as he could absorb by giving him an abundant supply of fresh air. He approved of the use of digitalis as a heart stimulant in the early stage of pneumonia, but in the later stages, when the heart was working hard to overcome the contraction of the peripheral blood vessels arising from the action of the toxins, the administration of digitalis did not meet with his approval; it seemed too much like spurring on a jaded horse. The failure of the cold applications in the

case in which Dr. Janeway had found phenacetin so efficacious could in all probability be explained by the manner in which they had been made. As he had said in his paper, everything depended upon the exact manner in which the cold compresses were used. It was for this reason, he believed, that the profession had been so long in recognizing the great value of this method of treating pneumonia.

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