The Journal of the American Medical Association

Published under the Auspices of the Board of Trustees.

VOL. XXXIX.

CHICAGO, ILLINOIS, JULY 5, 1902.

No. 1.

Original Articles.

THE TREATMENT OF PNEUMONIA.*

N. S. DAVIS, JR., M.D.
CHICAGO.

THE INCREASE OF PNEUMONIA.

The mortality from croupous pneumonia has been increasing for many years; for instance, in Chicago, in 1852, deaths from pneumonia constituted 1.66 per cent. of those from all causes; ten years later 3.40 per cent.; in 1872, 4.55 per cent.; at the end of another decade 6.26 per cent.; in 1892, 9.14 per cent., and in 1902, approximately, 12 per cent. If I had quoted the annual percentage mortality from this disease its steady increase would have been emphasized still more. However, Chicago is not peculiar in this, for statistics show that in all civilized countries pneumonia has been increasingly prevalent and fatal.

Naturally we ask, who is responsible for this—the physician, the patient or the disease? Are we less successful than our ancestors were in the management of the malady?

HISTORICAL SURVEY.

Although the word pneumonia has been in use for many centuries, it was not confined to the specific disease which we know by that name until comparatively recent times. Prior to 1818, when Laennec made it possible to clinically differentiate the thoracic affections, it was used to name all of the severe acute inflammations of the pleuræ, lungs and bronchi. It is therefore impossible to compare the treatment of to-day with that of times earlier than the end of the first quarter of the nineteenth century. Indeed, the authors of many of the leading treatises upon medicine in the middle of the last century made no difference in the treatment of acute croupous pneumonia and pleurisy, although they recognized their clinical differences.

TREATMENT BY BLEEDING.

In the thirties and for twenty years thereafter bleeding was regarded as the most important measure which physicians could use for the relief of pneumonia. At first frequent and copious bleeding was recommended. Indeed, it was advised that blood be abstracted whenever respiration was excessively quick and labored and the temperature high. It is true that a fall in temperature was thus effected and that breathing became slower and deeper and often the mind clearer. It was also insisted that, at times, if bleeding was practiced early in the stage of congestion, the malady could be checked in its progress and convalescence established by the third day. But I presume many of you have seen, as I have this

winter, a crisis occur upon the third day and complete recovery follow. It is doubtful if the disease has ever been "jugulated" at any stage of its progress.

DECLINE OF VENESECTION.

Between 1840 and 1855, bleeding was recommended only in the stage of congestion and was believed to be of little use when lung tissue was hepatized. In this period, too, it was regarded as not useful when pneumonia attacked those who were weak and debilitated. Since 1860 venesection has rarely been resorted to. Unquestionably a moderate bleeding, when a large area of lung tissue is congested but not yet hepatized, is safe in full-blooded and robust individuals, and it will add to their comfort, lessen pain, lower temperature, slow respiration and often unload an over-burdened right heart. Occasionally to-day under these circumstances, bleeding can be done with distinct benefit. Last winter an accidental hemorrhage from one of my patients showed me its utility in later stages of the disease. The patient had both typhoid fever and pneumonia of a severe type. On three different occasions, about three days apart, he became semicomatose and deeply cyanotic, because of edema of the lungs. All his symptoms pointed to a probable loss of life within a few hours, when on each occasion a spontaneous and copious hemorrhage occurred from the bowels. At once after each hemorrhage improvement set in, cyanosis disappeared, the physical signs of pulmonary edema disappeared and consciousness returned. Ultimately he recovered from the combined attack of these maladies.

TRUE VALUE OF BLOOD-LETTING.

Although bleeding can be resorted to with benefit in pneumonia, it has been abundantly shown not to shorten the course of the disease or to influence the vitality of the germs which cause it. I believe it is most useful in order to unload a dilated right heart. Therefore, when the jugulars are distended and the pulse is small, comparatively soft and increasing in rapidity, when the second pulmonary sound over the heart is strongly accentuated or the lungs are filling with the coarse, moist râles of edema, it may be resorted to with hopefulness.

TARTAR EMETIC.

When bleeding was first used in pneumonia, it was because the essence of the disease was believed to be congestion and inflammation. Rasori, and his numerous followers, thought that stimulation was even more its essential attribute. To combat this he urged the employment of large doses of tartar emetic. Rasori used as much as 8, 10 and 12 grams of this drug per day for several days in succession. After the first dose a tolerance of it was usually acquired. That it lessened the rapid respiration, softened the pulse and quieted the

* Read before the Illinois State Medical Society, Quincy, Ill., May 21, 1902.

patient was unquestionably true. But it also irritated and inflamed stomach and bowels, caused depression, almost a condition of collapse, and a weaker heart. The enormous doses advised by Rasori were not long used. Even Laennec, who was a staunch advocate of its employment, advised doses of not more than 1.5 grams per day, and some years later Trousseau recommended it in much smaller doses. Tartar emetic is now rarely used, and never in large amounts. Modern pathology affords no reason for its employment as a means of combating the cause of the disease and it has been found to neither shorten the course nor lessen the mortality of pneumonia. Moreover, its physiologic effects are so distressing and so enervating that it would be difficult to revive its use.

BLISTERING AND POULTICING.

While bleeding and tartar emetic were in vogue, blistering and poulticing were also regarded as important adjuvants to treatment. Blisters, ten and twelve inches long and five or six wide, were placed upon the affected side. They were covered and followed by fomentations until recovery or death occurred. Blisters, it is true, are particularly efficacious for the relief of the pleuritic pains which accompany pneumonia, but neither they nor fomentations materially alter the course of the disease.

Poultices which envelop the chest make respiration easier and coughing less frequent. These effects are best observed in children to whom they can be most successfully applied. It is so difficult to keep the large fomentations which must be used in adults, warm, and the frequent application of new ones causes so much discomfort, that they are for the most part discarded.

VERATRUM VIRIDE.

In this country about the time bleeding ceased to be generally practiced, veratrum viride began to be used in the treatment of pneumonia. It was found to diminish the tension of the pulse, lessen its rate, lower bodily temperature and provoke perspiration. After some years of trial, clinicians concluded that it, too, was adapted only to sthenic cases and to the stage of congestion. Numerous studies of its physiologic action in the seventies and since then, have shown that it affects both the nerves and muscle fibers of the heart stimulating the inhibitory nerve and paralyzing the muscle. There is produced by it both vasomotor and cardiac weakness and ultimately paralysis. It is therefore not a safe drug to use in pneumonia, when the preservation of cardiac strength is all-important. However, it will contribute to the comfort of patients, and can be employed without hazard when they are young and vigorous, and when the area of lung tissue involved is small.

CALOMEL.

During its period of vogue, calomel has been used in large doses to combat pneumonia. But it has fallen into disuse to-day, for it does not shorten the course of the malady, contribute to the comfort of the patient or lessen the mortality. However, it can be employed with benefit as a laxative at the beginning of an attack or during its course.

CHANGES IN THE PLAN OF TREATMENT.

These various anti-phlogistic measures of treatment were employed to attack the disease when it was believed to be an acute inflammation resulting from exposure to cold. That they did not modify the course of pneumonia or affect the rate of mortality began to be appreciated about 1845, when the fact that as low a mortality was observed in the homeopathic hospital at Vienna as in institutions where bleeding, blistering and tartar

emetic were used induced Skodd to try other methods of treatment. The English-speaking people were awakened to the inutility of the prevailing treatment by the writings of Bennett of Edinburgh in 1848.

As anti-phlogistic methods, the methods of offense were discarded, those of defense were adopted. However, at first, remedies for the most part were applied empirically rather than with the intelligence with which they are now used.

DISCOVERY OF THE MICROBE.

About the end of the third quarter of the last century the discussion waxed hot as to whether the important symptoms of pneumonia were due entirely to inflammation of the lungs, or whether they were manifestations of a general disease, the pulmonary inflammation being only one element of the malady. A little later the discovery of the microbic cause of pneumonia settled this dispute.

TREATMENT OF TO-DAY.

The protective or defensive treatment of to-day recognizes the fact that a patient's life is endangered, 1, by the toxins produced by the diplococcus lanceolatus; 2, by the rapid involvement of large areas of lung tissue in inflammation which makes them functionally useless; 3, by the sudden distension of the right ventricle to the point of paralysis by obstruction of the pulmonary vessels; 4, by edema of the lungs, the result of a weak heart, enfeebled respiration, and probably of toxins which excite edema in tissues no longer possessing the vitality required to develop the changes characteristic of inflammation.

As yet, no specific has been found to combat pneumonia, or to protect those who are exposed to it. Nor can we prevent the extension of the lung lesion from one point to another.

We know that so long as only a part of one lung is involved in a person who is young and vigorous, recovery is the rule and little medication is needed.

The general symptoms or evidences of pneumonic intoxication are in proportion to the extent of the pulmonary lesion. Therefore, the gravity of the case can often be measured by it, but not always, for even death may occur when pneumonic inflammation is very limited and the amount of toxins small in one who is debilitated, and especially in one who is nervously enfeebled.

ELIMINATION.

To prevent the accumulation of toxins the organs of elimination must be kept active. We do not know with certainty whether the toxins of pneumonia escape through other channels than the kidneys. However, to promote early and full evacuations from the bowels, undoubtedly contributes to the comfort and well-being of patients. Therefore, a purge should be given at the onset of the trouble. It may consist of calomel or a saline, or both. The bowels should be moved regularly thereafter and kept as free from putrefying matter as possible. Digestion is always slow and imperfect in pneumonia. Consequently, food, if taken in considerable quantities or in any except the most digestible form, will undergo abnormal fermentation in the gastro-intestinal tract, and produce toxins which will add to the irritation of the kidneys, already often affected by the toxins peculiar to pneumonia. Furthermore, they produce a nervous depression and lack of tone which under other circumstances we know so well as a "bilious state." Therefore, it is essential that only the most digestible foods and those least liable to abnormal fermentation be eaten. Milk should be the chief article of nourish-

ment. But in addition to it, broths, a little of gruels and such fruit as oranges can be taken. During the three or four days when the disease is at its height, milk alone is the best food and only moderate amounts of it, two or three pints in the twenty-four hours should be given, but water should be drunk as freely as possible. Such a liquid diet will stimulate excretion by the kidneys and will not overtax digestion. The broths will help to restore to the blood some of the salt lost by it and deposited in the hepatized lung, which, moreover, is important, in order that osmosis and metabolism may proceed normally.

When the urine is particularly small in quantity and there are evidences of deep intoxication, large subcutaneous injections of physiologic salt solution often do good by provoking freer diuresis, and more rapid elimination of toxins.

Elimination by the skin should be encouraged by sponging with warm or tepid water.

USE OF OXYGEN.

Cyanosis is due in part to the hepatization of large areas of lung tissue, in part to an enfeebled pulmonary circulation, to toxemia and sometimes to edema of the lungs. That which will maintain cardiac strength and vigorous breathing will arrest and relieve cyanosis. The distress which accompanies it can, moreover, be greatly mitigated by the inhalation of oxygen. I know of nothing which contributes more to the comfort of patients than this gas does. Unfortunately, like food, it will only help to maintain strength and comfort, but can not check the progress of the disease. Therefore, in the severe cases in which cyanosis indicates the employment of oxygen, it is rare that life is saved by its use although it may be prolonged.

CARE FOR THE HEART.

The attention of the profession has been centered of late years upon the heart, I am tempted to say, too exclusively. And yet the maintenance of its strength and a suitable balance of arterial and venous blood is all important. If the obstruction to pulmonary circulation which exists in pneumonia developed gradually, it is probable that the heart would not be injured by it. But coming with suddenness it is especially apt to dilate and weaken the right ventricle. Dangerous distension of the heart is produced frequently when new and extensive areas of lung tissue are hepatized by an extension of the disease, for the heart weakened by the first attack of the malady can not resist such extensions. Other factors than pulmonary congestion play a part, however, in producing cardiac weakness. The disturbed metabolism of the muscle which is incident to the febrile state and an imperfect supply of oxygen are some of them. Digitalis is more relied upon than any other drug to support the heart. But other cardiac tonics, such as caffeine, strophanthus and cactus can be used in its stead. Digitalis should be given as soon as the heart-beats range above 100 per minute. It must often be prescribed in doses larger than are commonly given, for in pneumonia a resistance to it is most noticeable.

In 1888, Petresu of Bucharest urged that it be employed in excessively large doses and lauded it as almost a specific for the disease. It was his habit to give for three or four days a tablespoonful every half hour of an infusion made of from eight to twelve grams of leaves in 240 c.c. of water. He treated soldiers in time of peace who were young, vigorous men, when they were attacked by the ailment—conditions under which the mortality from it is always lowest. The utility of such large doses has not been confirmed, and patients found

in city hospitals are unable to take even much smaller ones without exhibiting symptoms of poisoning.

Theoretically, strophanthus seems preferable to digitalis, as it affects the heart with equal power, and does not contract the peripheral arterioles to the same extent, and thereby increase the work which the heart has to do.

Strychnia is another drug relied upon to-day, chiefly because it is the best respiratory tonic which we possess, stimulating deeper and stronger breathing. It is also a cardio-vesicular and general tonic of exceptional value. In all severe cases it must be employed when respirations are excessively quick and shallow and the pulse is fast. In the worst cases it is best given hypodermically.

DIFFUSIBLE STIMULANTS.

Diffusible stimulants are often needed. Their transitory effects must, however, be remembered. The aromatic spirits of ammonia and the carbonate of ammonia are the best. The first can be given every one or two hours. The latter every two or three. They are also useful expectorants, helping to make less tenacious the secretions in the bronchial tubes and to keep them unobstructed. These ammonia compounds are prompt and efficacious in their action. They are especially indicated when the pulse is quick, small or irregular.

Alcoholic beverages have for many years been used under the same circumstances. They have been given in large amounts, so much as eight to sixteen ounces of brandy or whisky daily. At first urged upon the profession by Todd, they were used as food as well as stimulants. To-day, physiologists tell us that alcohol is not a food, or if one, as some still contend, that it is of so little value as food as to be practically useless. No wonder, therefore, that experience as well as experiment has led to a lessened employment of alcoholic beverages. The best experimenters teach that the stimulant effects of alcohol upon the hearts are obtained only from small doses and that they are very transitory, of about fifteen minutes' duration. When large doses are given, anesthetic effects prevail, which lessen the force of the heart, cause it to dilate more easily, make respiration shallower, and therefore increase the danger of cyanosis. From trials of it and much experience in the treatment of pneumonia without it, I am convinced that alcoholic beverages are unnecessary, that the ammonia compounds are more reliable, and that if used persistently the alcoholics do harm because of their anesthetic and paralyzing powers. Alcoholics lessen the oxygen-carrying power of the blood, and therefore increase any tendency to cyanosis. They disturb metabolism and hasten muscular degeneration. They dilate the peripheral arterioles and lessen diuresis. This enumeration of the ill effects of the doses of brandy and whisky, commonly used in the treatment of the malady, might be lengthened had I time.

ANTIPIRESIS.

When chemical antipyretics were first introduced to the profession, they were extensively employed in pneumonia. But they have been discarded as dangerous. Their effect upon metabolism, by which they lessen fever, is very similar to that of alcohol, only it is more pronounced. So little are they used now that I need not explain why they have proved harmful.

Cold baths were employed as an antipyretic measure, as early as 1850, by Vogel of Berne, and later their use was urged by Lebermeister. Full tub or sponge or douche baths have been given every two hours when a patient's temperature has been above 102.5 or 103 degrees. The first statistics gathered seemed to show that this treatment lessened the mortality from the disease,

but more experience has not confirmed this. However, it has been shown that cold baths are harmless. Now they are used rarely in pneumonia unless there is hyperpyrexia, when ice-cold baths and packs are relied upon.

OPIATES.

Pain, coughing and weariness caused thereby often lead to the administration of opiates and other soporifics. Such drugs can be used safely only in mild cases and at the onset of the malady, for later they will make respiration shallower and less vigorous, thus contributing to the development of cyanosis. They also suppress coughing and thereby lead to an accumulation of mucus in the air passages, which will interfere with breathing. Moreover, elimination by the kidneys is lessened by them. The inutility of the autopneumonic serums upon the market has been shown recently by several writers and need not be discussed in detail by me.

PROPHYLAXIS.

After this short and somewhat imperfect review of the treatment of pneumonia, past and present, I believe that you will agree with me that never have physicians known so much of the nature of pneumonia or used remedial agents more intelligently than now. It is not their fault that the mortality of this disease is increasing. But is the medical profession altogether free from blame for its prevalence? Prophylactic measures have not been enforced as they should have been. It is well known that the cause of pneumonia is a micro-organism in the sputa of those suffering from the disease, and that the malady is engendered by inhaling it. Therefore, the same care should be taken to collect and destroy the sputa that is taken in pulmonary tuberculosis. It is not, however, a sufficient precaution to exercise this care during a patient's brief sickness, because the diplococcus of pneumonia is known sometimes to live and multiply for months and even years, in the mouth, pharynx and nose of those who have had the disease. Therefore, during convalescence, and for at least two or three weeks thereafter, expectoration, if it occurs, should be into a sputa cup containing an antiseptic and water. Moreover, the patient's mouth should be rinsed several times daily with an antiseptic mouth wash. During the illness the greatest pains should be taken to prevent soiling bed clothing, carpets or furniture with the sputa. After the illness the patient's room should be thoroughly cleaned and ventilated. The enforcement of such measures will help to lessen the spread of this disease and will greatly lessen the frequency of its recurrence in those who have had it.

The facts that house epidemics are not infrequent and that the disease prevails as other contagious and highly infectious ones do in the winter season, when people are most crowded together and live much of the time in badly-ventilated apartments, suggests another prophylactic measure, which the public should be taught to apply, namely, thorough ventilation of houses, offices, factories, theaters, churches, cars and other public places, in order that the air which must be breathed may be kept clean and free from infectious matter.

Laymen should be taught not to be afraid of a patient who has pneumonia, influenza or tuberculosis, but to be afraid of lack of cleanliness about him during his illness, of failure to enforce prophylactic measures and of close, badly ventilated apartments during the seasons when these diseases prevail.

Although experiments with pneumonic serum have shown that a temporary immunity can be created in certain lower animals, it can not be in man. These experi-

mental successes, however, lead us to hope for more certain means of preventing pneumonia than we now possess.

SYMPTOMATIC TREATMENT.

"Masterly inactivity" does not lead to success in the treatment of pneumonia, but intelligent, masterly activity directed to the preservation of strength and amelioration of symptoms which cause discomfort, does. Above all things it should be remembered that it is not a Greek name which is being treated, but a living man, to whose changing needs treatment must be adapted. Indeed, that physician will be most successful who has not a routine treatment for the disease, but who can appreciate the condition of his patient, and who knows how to meet each condition with appropriate remedial agents.

LIFE AND WORK OF THE LATE PROFESSOR CHRISTIAN FENGER.

MEMORIAL ADDRESS DELIVERED TO THE GRADUATING
CLASS OF RUSH MEDICAL COLLEGE, APRIL 4, 1902.

N. SENN, M.D., PH.D., LL.D., C.M.

PROFESSOR OF SURGERY.

CHICAGO.

At non ingenio quaesitum nomen ab aëro excidet: ingenio stat sine morte decus. (Propertius.)

On November third, nineteen hundred, there transpired an event in the city of Chicago unparalleled in the history of medicine. The great banquet hall of the Auditorium Hotel presented an inspiring scene. Four hundred and eighty physicians representing one hundred and thirty-nine medical societies and every section of the country, from Canada to the Gulf and from the Atlantic to the Pacific, were gathered around the festive board in honor of a colleague who, by his pioneer scientific work in this city, had won their esteem and veneration. No participant of that great banquet will ever forget the transactions of that memorable evening. It was a gathering characterized by an unanimity of feeling. Colleagues and students had come to pay their tributes to a master. The occasion was a genuine love feast. The walls of the great hall echoed cheer after cheer in honor of the guest of the evening. The speeches made recited the deeds of the central figure of the festivities and congratulated him on the high position he had attained in his profession.

The honored guest had reached the mature age of 60. For twenty-three years he had been the guiding star of the local profession. During this time by his indefatigable labor he had brought about a reformation in the teaching and practice of surgery that harmonized with the progressive spirit of the present age. By the most unselfish and hardest kind of work he had won the esteem and affection of his students and colleagues. From the moment he set his foot on American soil he entered enthusiastically upon his missionary work by teaching and example. In that great audience were a large number of his most illustrious students who owed their early success in life and their high professional attainments to their master, who stimulated and encouraged their desire for scientific knowledge and original research. If it had not been for such an inspiring and guiding spirit, the medical world might never have heard of Billings, Murphy, Herrick, Belfield, Favill, Hektoen, besides scores of others of his former students, who now occupy, with them, the front rank in the medical profession. These students manifested