

## PNEUMONIA IN PENNSYLVANIA.

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### INTRODUCTION.

Pneumonia is the most common and devastating of the acute infectious diseases which the 12,000 doctors of Pennsylvania are called upon to treat in a largely industrial population of slightly less than 11,000,000 people. Though there has been a slight decline in the mortality rate since the turn of the century, nevertheless, in 1936 there were 9094 deaths from pneumonia in Pennsylvania. No morbidity statistics are as yet available.

If a mortality rate of 25% may be assumed for all cases of pneumonia not receiving the benefits of modern therapy it is reasonable to conclude that somewhere around 35,000 cases of pneumonia occur in Pennsylvania each year. Statistics at their best, relating to epidemiology, morbidity, and mortality rates for an infectious disease such as pneumonia, can only be approximate when collected from hospitals and private doctors from all sections of the state.

Pneumonia is an acute infectious disease involving the parenchyma of the lung. It may be primary or secondary in origin. The differential diagnosis between a heavy cold and an early pneumonia may be well-nigh impossible, even in the best supervised clinics. The presence of one or more of the common strains of the pneumococci found in sputum, unless in overwhelming preponderance, does not *per se* indicate the etiological agent.

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It is unfortunate, in the light of modern therapeutic advancement, that not all cases of pneumonia are suitable for specific therapy. However, as a general rule, pneumonia is a fairly clearly defined entity, readily diagnosed in its early stages and promptly responsive to treatment.

#### HISTORY.

The control of pneumonia is a problem of the first magnitude to the practicing physician and public health officials, and the public which furnishes the victims. To Dr. George H. Bigelow, Commissioner of Health of the Commonwealth of Massachusetts, in 1931, goes the credit for the first Pneumonia Control Program on a statewide basis. With the aid of Dr. Benjamin White, Bigelow developed a plan that was started in January, 1931. This plan demonstrated that it was possible to obtain the coöperation of the doctors in general practice and that the establishment of modern methods of diagnosis and treatment throughout the entire state would result in a remarkable decline in the death rate. Chadwick,<sup>7</sup> in a paper read before this society in Baltimore, October 11, 1937, declared that during the first six years of the Massachusetts program more than 1100 doctors availed themselves of the facilities made possible through the Massachusetts Department of Public Health.

New York State followed Massachusetts in setting up a Pneumonia Control Program on a statewide basis. Other states became interested and at the present time 33 states have either set up or are planning to institute a Pneumonia Control Program.

In 1936 The Medical Society of the State of Pennsylvania created a Commission for the Study of Pneumonia Control. The members of this commission studied the methods being used by both Massachusetts and New York State. Many of the details in the Control Program of these two states were incorporated in the plans drawn up for the Pennsylvania Program.

With the coöperation of Dr. Edith McBride Dexter, who was then Secretary of Health of the Commonwealth of Pennsylvania, pneumonia was made a reportable disease in July, 1937. This constituted the first official step in the Pennsylvania Program. Following that, a survey was made of the hospitals of Pennsylvania, exclusive of Philadelphia and Pittsburgh, to ascertain whether technicians were available who could type pneumonias and if so, whether a 24-hour typing

service would be furnished for patients with pneumonia who were unable to pay for such service. For hospitals not having trained technicians, a week's training course at a designated hospital training center was furnished with a stipend of \$25.00 per week, transportation to and from the center and \$25.00 to the teacher as a nominal remuneration for each technician trained.

With the approval of the United States Public Health Service, a sum of \$60,000 taken from Social Security Funds was made available for Pneumonia Control Work. Differing from Massachusetts and New York states, Pennsylvania did not endeavor to develop its own serum, but used both typing and therapeutic serum from well-known manufacturers.

One hundred thirty-one Typing and Serum Distributing Centers were established at strategic points throughout Pennsylvania, where doctors were able to have typing of sputum or blood performed any hour of the day or night and also where serum for the commonly occurring types of pneumonia was made available without charge for any patient who was unable to pay.

In the early part of 1939, Dr. John J. Shaw was appointed Secretary of Health of the Commonwealth of Pennsylvania. In coöperation with the United States Public Health Service, a Division of Pneumonia Control was established in the Health Department. The personnel of the Division consisted of a Director, Dr. Dale C. Stahle, who had previously received an intensive training in the field of pneumonia at the University of Pennsylvania, and, in addition to the Director, there were two field technicians and a small office force to carry on the work.

#### OBJECTIVES OF THE PENNSYLVANIA PLAN.

The objectives of the plan are as follows:

1. To reduce the number of deaths from pneumonia in Pennsylvania.
2. To furnish every practicing physician within the state with the latest information and facilities available and required for making a correct diagnosis whenever possible.
3. To place in the hands of every doctor, serum for the treatment of any specific type of pneumonia for which serum is available, and finally, to furnish sulfapyridine. Sulfathiazole is going to be made

available by the State Department of Health to all physicians as of November 1, 1940.

In the autumn of 1939, Dr. John J. Shaw announced that sulfa-pyridine would be furnished to all physicians for the treatment of pneumonia cases. So far as is known, this was the first instance of a State Department of Health furnishing a chemical agent of proven value in the treatment of pneumonia free of charge to all patients who were unable to pay for the drug.

4. To conduct courses of instruction for technicians and for general practitioners under the supervision of qualified teachers.

5. To carry on an educational campaign among the laity, stressing the fact that any troublesome respiratory tract infection should be regarded with suspicion and for which prompt medical care was advisable.

In all the education work in Pennsylvania, the fact is stressed that pneumonia is the great medical emergency and as such should be treated immediately day or night. As appendicitis should require treatment as soon as the diagnosis is made, even more so is it important to establish the diagnosis and institute the treatment for pneumonia. So the popular parlance goes in Pennsylvania.

6. To carry on epidemiological studies of pneumonia in Pennsylvania.

7. To review the history of every fatal case of pneumonia in each county in an effort to identify more clearly the cause of death in every case.

8. To compare relative values of the various forms of therapeutic agents available at any given time.

9. To encourage research in laboratory, clinic and field, whereby better methods for pneumonia control may be devised.

#### ORGANIZATION.

To carry on the work of pneumonia control in Pennsylvania, the following organizations are represented:

1. The Medical Society of the State of Pennsylvania through its Commission.

2. The Department of Health of the State of Pennsylvania with its Division for Pneumonia Control and its newly created Division of

Health Education which is interested in conducting meetings on health subjects among lay organizations.

3. Influential lay groups throughout the state.

For purposes of medical organization, Pennsylvania is divided into twelve councilor districts by the State Medical Society. Each councilor district may include from one to six or seven counties. The Commission for the Study of Pneumonia Control of The State Medical Society is made up of representatives from each of the councilor districts and, in addition, has a number of recognized specialists among its membership. At the present time eighteen members constitute the Commission, which are as follows:

Leon H. Collins, M. D., Philadelphia; Harrison F. Flippin, M.D., Philadelphia; D. Sargeant Pepper, M.D., Philadelphia; Hobart A. Reimann, M.D., Philadelphia; George E. McGinnis, M.D., Norristown; J. Patrick McDonnell, M.D., Scranton; Wendell J. Stainsby, M.D., Danville; John V. Foster, M.D., Harrisburg; Russel H. Barnes, M.D., Tyrone; Frederick C. Lechner, M.D., Montoursville; Patrick E. Biggins, M.D., Sharpsville; George E. Stoney, M.D., Erie; Frank Pugliese, M.D., Delancey; George J. Kastlin, M.D., Pittsburgh; Wm. W. G. MacLachlan, M.D., Pittsburgh; James M. Strang, M.D., Pittsburgh; Bernard J. McCloskey, M.D., Johnstown; Edward W. Bixby, M.D., Wilkes-Barre.

SUBCOMMITTEES OF THE COMMISSION.

Committee on Statistics: Constantine P. Faller, M.D., Harrisburg, Chairman; Charles W. Smith, M.D., Harrisburg; Kenneth E. Quickel, M.D., Harrisburg.

Committee on Scientific Exhibit: Leon H. Collins, M.D., Philadelphia, Adviser; D. Sargeant Pepper, M.D., Philadelphia, Chairman; Mary H. Easby, M.D., Philadelphia; David A. Cooper, M.D., Philadelphia; Jefferson H. Clark, M.D., Philadelphia.

Committee on Education: Harrison F. Flippin, M.D., Chairman; Alexander M. Peters, M.D., Allentown; Patrick J. McDonnell, M.D., Scranton; John A. Fraunfelder, M.D., Nazareth; Robert E. Hobbs, M.D., Shenandoah; Roland N. Klemmer, M.D., Lancaster; Herman H. Walker, M.D., Linesville; Kelse M. Hoffman, M.D., Franklin; Jan Karolcik, M.D., Uniontown; Charles H. DeWan, M.D., Sayre; Harriet M. Harry, M.D., State College.

Each County Medical Society, likewise, has a local Committee for Pneumonia Control. There are 58 County Medical Society Committees in existence at the present time. Organized medicine today has approximately 200 doctors in a closely knit organization in Pennsylvania to carry on the educational work involved.

During the last three years, each County Medical Society has had one meeting each year devoted to a thorough discussion of the latest methods of the diagnosis and treatment of pneumonia. In addition, academies of medicine and hospital staffs have devoted a great deal of time to the review of difficulties encountered locally.

Local County Committees have been instrumental in encouraging general practitioners to utilize all of the facilities made available through an alert Department of Health and its Division of Pneumonia Control.

The Pennsylvania State Nurses Association is lending its cooperation and has appointed a representative in each district to cooperate with the doctors in carrying on educational work. Nursing of pneumonia cases is being stressed in classes to undergraduates throughout the entire state.

Visiting Nurse Societies in the metropolitan areas have cooperated splendidly in furnishing the necessary nursing care to patients living in congested districts whose limitations are apparent.

#### PNEUMONIA CONTROL CENTERS.

At the present time there are 180 Pneumonia Control Centers, mostly in hospitals, established at strategic points throughout Pennsylvania. All of these centers are capable of sputum diagnosis, blood culture studies, and the furnishing of simple laboratory procedures such as blood counts and urinalyses. While no blood levels of drugs used have been required, nevertheless, 1500 reports have been sent in of studies made in the field during the last year.

Fifty-three of the Pneumonia Control Centers are classified as major stations and have on hand serum for Types I, II, V, VIII, and XIV pneumococcal infections. The other stations have serum available for Types I and II. Sulfapyridine has been available at all the Pneumonia Control Stations for the past year and beginning November 1, 1940, sulfathiazole will likewise be made available. It is up to

the physician in charge of the treatment of the case to decide whether to use serum or drug.

The procedure in Pennsylvania is to advocate the use of sulfapyridine for 24 hours as soon as the definite diagnosis is made of pneumonia. If the patient is desperately ill and if the blood culture is found to be positive, serum in adequate amount is immediately recommended. During the early months of the Pneumonia Control Program insufficient quantities of serum were used by private physicians.

All types of therapeutic serum are held in readiness at the office of the Division of Pneumonia Control in Harrisburg and are available 24 hours a day.

Statistics indicate that 60% of pneumonia patients in Pennsylvania are hospital treated and 40% home treated. The mortality statistics are comparable in both series.

#### CONFERENCES AND REFRESHER COURSES.

Semiannual conferences, six in number, have been held. The attendance has varied from 75 to 175 at these meetings. Authorities on pneumonia review the new work on the subject and make recommendations to the Chairman from the local County Medical Society. After reports from the different counties of the state, a question and answer period is held. These meetings have been most beneficial and enthusiastically attended.

In the large number of Refresher Courses given throughout Pennsylvania, diagnosis has been emphasized as the key to the successful treatment of pneumonia. Doctors are particularly warned not to use serum in the absence of a specific bacteriological diagnosis. It has been found that in certain circles doctors are wont to give the patient a combined Type I and Type II serum in the hope that they strike a lucky hit. Results have been disappointing and the practice is, of course, discouraged.

Reports indicate that the practice of prescribing sulfapyridine for any respiratory infection in the absence of a specific bacteriological diagnosis is widespread. In the educational campaign in Pennsylvania, the use of serums or chemical agents in the treatment of virus infections and numerous non-pneumococcal types is condemned as dangerous. It is likewise pointed out that drug eruptions and toxic

reactions frequently occur. There's where the matter stands for the present.

#### LAY EDUCATION.

The Division of Health Education under the capable direction of Mrs. Edna M. Kech and her corps of field workers arranged for 122 meetings before large lay audiences since January 1, 1940. For these meetings there was a total attendance of 44,289 people. For the current season, 103 meetings devoted to pneumonia have already been scheduled for various sections of Pennsylvania.

These meetings are held in the various communities with the coöperation of The County Medical Society, which furnishes qualified speakers. Many of the larger county societies in Pennsylvania now are conducting Speakers Bureaus and also are carrying on the classes for instruction in the art of speaking before lay groups. The work of the Division of Health Education has received high commendation from public officials and public-spirited laymen. Many other states have sent representatives to study this phase of the work in Pennsylvania. It might also be stated that this Division is likewise carrying on lay meetings for discussions on cancer, tuberculosis, diabetes, maternal mortality and venereal disease control.

#### PNEUMONIA CONTROL AS A PUBLIC HEALTH RESPONSIBILITY OF THE PRIVATE PRACTITIONER.

According to the definition of Haven Emerson, the preservation of community health is the major responsibility of the public health officials, whereas the problem of the individual and his health needs is the domain of the general practitioner. Pneumonia control furnishes opportunities alike for the public health official and the private physician. The public health official without the utmost coöperation on the part of the medical profession cannot hope for any substantial success in wiping out the ravages of pneumonia; nor can the private doctor, the County or State Medical Society, wage a campaign directed to reducing the death rate from pneumonia without the aid and coöperation of public health officials. Each has his legitimate responsibility.

Pneumonia is a specific disease. It has a definite onset and method of spread. Effective therapeutic agents are now available. The problem, then, resolves itself into having a highly trained corps of workers in the field, that is, doctors and nurses who understand the



importance of regarding pneumonia as the great medical emergency, therefore bidding for diagnosis at the earliest possible moment and the prompt institution of energetic treatment.

Instruction of the public regarding methods of avoidance of contacts with respiratory affections, encouragement of the preservation of sound habits of health with regard to diet, elimination and rest and prompt consultation with the family doctor when troublesome symptoms occur should serve first to maintain the public resistance at a satisfactory level, and second, place patients in the hands of doctors at the earliest time in case involvement of the lung occurs. Prompt action on the part of an enlightened laity and a well-trained alert medical profession would reduce spectacularly the mortality rate from pneumonia. The promise for a happy outcome is much greater, for example, than when dealing with heart disease, cancer or even diabetes.

#### BULLETINS.

In 1937 a series of instructive short bulletins, one or two pages in length, were published at regular intervals by The State Medical Society. The first group of thirty bulletins, including the highlights of the etiology, differential diagnosis and latest methods of therapy, proved so popular with the doctors that a second series of bulletins, twenty in number, has been published during the past year. These bulletins, written by various members of the Commission of The State Medical Society, have been drawn up in a newsy fashion designed to catch the eye of the busy doctors who are not inclined to read exhaustive treatises. Further bulletins will be published from time to time and distributed widely throughout the state as the occasion requires.

#### RESEARCH WORK ON PNEUMONIA.

Researches are being conducted in the field of pneumonia by groups in certain medical schools within the State of Pennsylvania. Hobart Reimann and his colleagues at Jefferson Medical College are interested in further clarification of the so-called non-specific types of pneumonia, those more mild infections that run at periodic intervals through institutions; W. W. MacLachlan at the University of Pittsburgh has been thoroughly studying the possibilities of the use of quinine derivatives and has been able to obtain a mortality rate comparable to that with sulfapyridine; Flippin and the group at the Uni-

versity of Pennsylvania are carrying on investigations with the various new chemotherapeutic agents, and their work in the use of sulfathiazole particularly has been a valuable contribution to the field of therapy of pneumonia.

At the present time, Dr. Shaw and a number of advisers are drawing up a plan for a moving picture which will be shown before lay groups and in colleges. The film on tuberculosis has been so widely accepted in Pennsylvania that it was deemed advisable to make another moving picture on the subject of pneumonia.

#### REPORTING CASES.

Previous to July, 1937, pneumonia was not a reportable disease in Pennsylvania, and therefore, no information was available regarding the extent of the problem. Previous to the creation of the Division of Pneumonia Control, the Commission of The State Medical Society endeavored to collect statistics through the members of the Commission and local representatives. A series of 5977 cases in the 1938-39 season was compiled by the Sub-Committee on Statistics of the State Commission.

Since the development of the Division of Pneumonia Control with Dr. Stahle coöperating, approximately 9000 cases have been reported.

If, in the opinion of the physician, his patient would find it a hardship to pay for the diagnostic procedures indicated and the serum or chemical for treatment, he immediately applies to one of the Pneumonia Control Centers for assistance. After his diagnosis has been made the doctor may procure the serum or drug he desires for treatment. He is asked to fill out a simplified card and forward it directly to the Division on Pneumonia Control in Harrisburg, Penn. In the event that the doctor is tardy in reporting the case, one or two letters are sent out and if he fails to comply, his name is sent to the Chairman of the local Pneumonia Control Committee. Thus far over 96% of all these cases have been reported.

#### COUNTY PROGRAMS FOR PNEUMONIA CONTROL.

The various counties throughout the Commonwealth have instituted local campaigns with gratifying results. Allegheny County happens to have the highest mortality rate in the entire nation. Five

years ago the City Council of Pittsburgh appropriated the sum of \$25,000 to purchase serum for the treatment of pneumonia patients. Pittsburgh, situated as it is in the heart of the industrial section of the state, is known for the deadly character of the pneumonia occurring in Allegheny County. No one knows why this is true, but, even before it became one of the industrial centers, respiratory infections always exacted a high toll. The doctors of Pittsburgh with the public health authorities are sensitive to their responsibilities and are at present waging an active battle in an endeavor to reduce the ravages of the disease.

In Philadelphia County with the public health officials and The County Medical Society Committee working hand in hand, twenty inspectors have been assigned the job of collecting the data each week from the various hospitals in the county. In addition, weekly bulletins are requesting physicians to report their private patients through the proper channels.

Less populated counties are taking pride in the reduction in the mortality rate from the respiratory infections as shown by the downward curve throughout the entire state.

The individual upon whose shoulders rests the responsibility for the success of saving patients from dying from pneumonia is the family doctor or the physician in charge on hospital service. Facilities for diagnosis and treatment need be immediately available whether it be in the home or the hospital. Of course patients may be much easier treated in the hospital. On the other hand many do not choose to avail themselves of hospital care. Therefore a flexible system is required that will furnish necessary facilities for patients in their homes.

#### LIMITATIONS OF VITAL STATISTICS ON PNEUMONIA.

The clinical picture of pneumonia during the past decade is changing. It is less frequent that one sees a case with a rapid onset with chills, fever, pain in the chest, rusty sputum, etc. That description is found in textbooks today and less commonly in the doctor's experience. Signs of consolidation may appear without any sputum whatsoever. The blood culture may be negative. The patient may appear to have pneumonia with relatively few, if any, physical findings. A vulnerable cardiovascular equipment plus or minus defective renal function with exhaustion and anemia may all but bring about a

patient's exitus and have the final collapse brought about by a pneumococcal invasion. Is this sort of fatality primarily pneumonic in origin? That is one of the objectives the authorities in Pennsylvania have set for themselves in a check-back on pneumonia deaths reported to the Bureau of Vital Statistics.

A fully developed case of lobar pneumonia with an abundant and predominant flora of organisms in the sputum is easy to diagnose, but it is often impossible to differentiate between an influenza, pneumonia, and a pneumococcal or streptococcal pneumonia when a bacteriological diagnosis is negative.

Faulty technic adds a considerable number to the group that perplexes the statistician. Vagaries of innumerable degree beset the analyst when confronted by the approximately 50% of cases that have a negative bacteriological report. At best, one should be generous in the admission of a statistical error of plus or minus 20%, particularly when handling statistics sent in by an army of general practitioners who, to say the least, are not vital statistic conscious.

In an analysis of 131 cases of fatal outcome signed out as due to pneumonia, death due primarily to pneumonia was present in 76 cases, or 65.5%; death due to pneumonia secondary to or following other illnesses in 26 cases, or 26.4%; and incidental terminal pneumonia was found in 14 cases, or 12%, of this short series, which was compiled by the Sub-Committee on Statistics of The State Medical Society's Commission.

It should be recognized that pneumococci in the sputum are by no means conclusive of the presence of pneumonia, nor do râles in the chest with a temperature equal pneumonia. Evidence of infiltration or consolidation as shown by the roentgenographic studies is not necessarily pneumonic in origin unless supported by the proper clinical findings.

Postoperative atelectasis or pulmonary infarction is commonly mistakenly diagnosed as pneumonia, and congestive cardiac failure with evidence of consolidation at both bases, increased respiration and leukocytosis, even with the presence of pneumococci in the sputum, is certainly not pneumonia.

These problems are mentioned merely for the purpose of drawing attention to the common errors that may enter the picture and alter the conclusions of statistical analysis. Over a period of years, how-

ever, the diagnostic errors should neutralize themselves and the trend of events should be discernible; at least until more exact methods of diagnosis and statistical collection are available, the methods now in use must suffice.

#### STATISTICS.

The collection of statistics is, of course, a troublesome item. Doctors in practice are busy and harassed. They tend to disregard the filling in of simplified forms. Nevertheless, the physicians of Pennsylvania have been most coöperative and during the last year have sent in 96% report blanks on cases that have been treated with facilities made available through the State Department of Health. Over 300 cases that were treated as private patients were also reported.

Ten years ago Pennsylvania, with 9426 deaths from pneumonia, had the 8th highest mortality rate of any state in the Union. Last year 4782 deaths were recorded. Pennsylvania, therefore, dropped from 8th to 43rd place in the list of pneumonia mortality among the states. No state with a lower rate than Pennsylvania has at present ever been listed one in which pneumonia was an especially serious health problem.<sup>2</sup>

In addition to patients treated in hospitals and private practice, the Pneumonia Control Program furnished material for the diagnosis and treatment of 1200 patients in 1937 and 1600 additional patients in 1938. For this group there was a mortality rate of 14.3%, approximately  $\frac{1}{2}$  of that anticipated for untreated patients.

During the past four years a widespread and an intensive educational campaign has been carried on throughout the entire Commonwealth. It is safe to say that a high index of suspicion regarding pneumonia has been created in the minds of the majority of practicing physicians in the state. The Department of Health and the State Medical Society have combined in offering to the physician all of the available and the necessary facilities for diagnosis and effective therapy.

Red tape has been reduced to a minimum. The doctors may procure any or all of the facilities and in return are asked but one favor and that is to fill out the clinical record and return it promptly to the Division of Pneumonia Control in Harrisburg. Ninety-six per cent of all cases treated with State Health Department material have been reported back to the department by record.

Approximately half a million sulfapyridine tablets have been distributed since November 1, 1939. More than 300,000,000 units of serum have been issued. Approximately 9500 patients have been treated by one or other, or the combined method. A mortality rate of just above 10% in 7655 cases tabulated to date has been determined by the Division of Pneumonia Control. This figure is likewise uncorrected and includes all terminal cases with advanced heart disease, cancer, and similar chronic disorders. It also includes cases with no regard to the duration of the disease and the beginning of treatment. If the patient dies within four to six hours of treatment he is still classified as a pneumonia death and someone is surely to blame if the neglect has occurred. In 7655 cases there were 830 deaths. The calculated mortality for this group of 7655 patients treated along conservative lines would have been approximately 2500; therefore, modern treatment has presumably saved 1600 patients who otherwise would have died.

The etiological organisms present in 52.7% of the typed cases were Type I, Type II and Type III, with the virulent Type III organism being the second most frequent etiological organism and accounting for 15.41% of the typed cases. Bacteremia was present in 16.6% of cases on whom blood cultures were taken.

During 1937-38 and 1938-39 1111 cases of Type I and Type II were treated, with a mortality rate of 14.8%. During the past pneumonia season 1330 cases of Type I and Type II infection were treated with a rate of 7.16%.

In the series of cases studied that were given the combined therapy of serum and sulfapyridine alone, the mortality rate was higher. This, we believe, is due to the severer infection in which the doctors believed that serum was indicated. There was a positive bloodstream infection in 13.5% of the cases treated by sulfapyridine alone, and 27.4% with the sulfapyridine and serum together. For Type I the bacteremic incident, combined treatment rate was 21.36%, while for the drug alone it was 13.2%. For Type II, drug alone was 31.81% and combined therapy 30.11%. For Type V, VII, VIII and XIV treated by drug alone, it was 15.5%, and with the combined treatment 29.41%.

In the present series available for study the mortality has been higher in the so-called higher types of infections than in the lower

more common Types I, II, VI, and VII and VIII. Furthermore, it was found that the mortality rate was highest in those cases which were not typed.

It is readily admitted that these statistics are not satisfactory. They mark merely the beginning of an energetic campaign in Pennsylvania. Every year the number of patients with pneumonia being reported is increasing and the mortality rate thus far has shown a remarkable decline. More accurate data are being daily collected regarding the etiological agency responsible and the profession throughout the state is rapidly attaining a competence in expert treatment. Joslin once made the statement of accountability that for every death from diabetes some one was responsible. This statement has been translated into the field of pneumonia control in Pennsylvania. It has served to make the doctors more responsive and to instill in the public a desire for earlier and better medical care.

The ideal agent for the treatment of pneumonia has not yet been developed. Serum is cumbersome, troublesome and sometimes provokes a reaction. In about 75% of cases sulfapyridine causes a reaction which may vary from the most mild type of nausea up to the severe grades of skin eruption and drug fever. Sulfathiazole has produced reactions in approximately 30% of the cases.

Other chemical agents are now being tried in various clinics throughout Pennsylvania that give some promise of being even more effective than the drugs now being widely distributed and with less toxic reaction. With these new developments on the medical horizon it begins to appear as though pneumonia like tuberculosis, typhoid fever, smallpox and diphtheria must give way as the principal cause of death among the acute infectious disorders in Pennsylvania.

#### SUMMARY.

1. Pneumonia is the most serious of the acute infectious diseases occurring in Pennsylvania.
2. While there has been a gradual decline in the mortality rate since the turn of the century, no marked reduction was demonstrated until 1937.
3. Since the Medical Society of the State of Pennsylvania through its Commission for the Study of Pneumonia Control and the

State Department of Health have joined forces and organized a program, the mortality rate has shown a substantial decline.

4. Ten years ago Pennsylvania with 9246 deaths had the 8th highest mortality rate of any state in the Union. Since the institution of the Pneumonia Control Program, the mortality rate for Pennsylvania has dropped from 8th in the list of states to 43d place.

5. The key to the saving of lives of pneumonia patients resides in early accurate diagnosis and prompt institution of modern therapy. Pneumonia should be regarded as the great medical emergency.

6. An intensive educational campaign has been carried on by The Medical Society of the State of Pennsylvania and the State Department of Health for instruction of all the physicians of the state in ways and means for diagnosis and treatment.

7. A far-reaching program of lay education has been instituted. Since January 1, 1940, 122 meetings have been held with an attendance of 44,289 people. The laity is instructed in the importance of prompt resort to medical care for all troublesome respiratory tract infections.

8. One hundred and eighty Pneumonia Control Stations have been established at strategic points throughout Pennsylvania. These stations furnish facilities for diagnosis. On hand are also serums, sulfapyridine and sulfathiazole. These are available to all physicians of the state. Diagnostic and therapeutic services are free of charge for all patients who are unable to pay for the same.

9. Physicians of the state are required to report all pneumonia cases directly to the Division of Pneumonia Control of The State Department of Health. During the past year, approximately 9000 cases have been reported. It is estimated that this is but a small percentage of pneumonia patients in the state. Each year the number of cases reported is increasing.

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## DISCUSSION.

DR. THOMAS DARLINGTON (New York, N. Y.): I should like to talk on the prevention of pneumonia. What we heard yesterday was the question of the treatment rather than prevention. From my standpoint there is no necessity for having any pneumonia whatsoever.

In 1904 the highest death rate was from tuberculosis and Osler called tuberculosis the captain of the men of death. But in 1905 the charts showed that the deaths from pneumonia in New York City passed those of tuberculosis. I had the privilege of appointing a Pneumonia Commission, only one member of whom is left today, and that is Dr. Longcope. He was the assistant who made most of the microscopic investigations. These investigators began by going to the New York University. It was suggested that the mouth might contain bacteria. In 1903 a book was published on *The Mycology of the Mouth*, which showed that people's mouths contained forty-eight varieties of bacteria, that you never could keep the mouth thoroughly cleaned and absolutely disinfected. An investigation was made of the mouths of the students of New York University, and it was found that seventy per cent of the students had the germs of pneumonia in their mouths. I suggested they go up to Kingsbridge, where I practiced at that time, and everybody was examined, the Sisters of Charity, the tradesmen, everybody who came down the street, and we found there that seventy per cent of the people whose mouths were examined had the germs of pneumonia in their mouths. By carrying that on throughout the city and in the public schools, we found that practically everybody in the City of New York except nursing babies had the germs of pneumonia in their mouths. How did they get them? When people talk they spray; of course some spray more than others, as you have noticed, but as people breathe in and out they not only spray outwardly but particularly when they are talking they also spray inwardly. A good many experiments were made by spraying the lungs with the germs of pneumonia to see if it could be gotten that way, and we found that it could be. There is no question in my mind that the majority of people who get pneumonia acquire it from the fact that they have the germs of pneumonia in their mouths and their mouths are not clean.

How are we going to help? I suggested a remedy to the New York Chamber of Commerce, that alcohol is our best disinfectant and that people rinse out their mouths with whiskey three times daily before and after meals, but spit the whiskey out. They could see no reason for spitting it out, but thought it would at least cleanse the mouth.

I have noticed on a number of occasions that men who talk for a long time acquire pneumonia after a long address. There is a case of a friend of mine who recently made an address in New York. He got his feet wet, and I did, too, at the same time, but he made a long address afterward and followed it immediately with lobar pneumonia, which started the next day with a chill—I don't know the type, it doesn't make much difference about the type. He did the speaking—I didn't; we both got our feet wet. He laid it to the wet feet. That may have had something to do with lowered resistance, but I didn't get pneumonia. I believe if the mouth were thoroughly cleansed, if people would brush their teeth before

and after each meal, and disinfect the mouth, we would get rid of pneumonia. We started that in New York after this investigation, and we tried to stop spitting. We put up "No Spitting" signs. On the ferry boats up at 42nd Street they had signs, "Life Preservers Will Be Found Under the Seats," so we put signs over them, "Spitting on the Floor Is Prohibited."

DR. RUSSELL L. CECIL (New York, N. Y.): It would seem that the captaincy of the men of death is being passed on rather rapidly these days. I don't think pneumonia will rank as more than a sergeant in another year or so. This is due largely to the use of the specific agent. In New York City last year our death rate dropped to 55 from a high of about 150 several years ago. I think this coming year it probably will be down in the 40's. This shows how very rapidly pneumonia is dropping as a cause of death. I think soon we may be under tuberculosis.

DR. EDWARD L. BORTZ (Philadelphia, Pa.): I think we could find a lot of Pennsylvanians who should be glad to follow Dr. Darlington's prophylaxis of rinsing the mouth out with whiskey, and as far as long speeches are concerned, it might be wise for those who are going to orate to practice what was recommended by one of the African tribes, that a man who was going to make a speech should stand on one foot and whenever the other foot touched the ground he was finished.

DR. JOSEPH H. PRATT (Boston, Mass.): I have been a member of the Committee on Pneumonia appointed by the Board of Health of Massachusetts since they began this statewide plan for diagnosis and treatment. We had a meeting of that committee only last week. In looking over the records of the previous year it was perfectly evident that physicians throughout the state made, on the whole, a very small number of blood cultures, and I should like to ask the reader of the paper what measures they take in Pennsylvania to secure blood cultures and how successful they have been. A simple outfit for taking blood cultures can be obtained at the many stations for typing and distributing of serum throughout the state, but, as I say, relatively few are taken, disappointingly few.

DR. EDWARD L. BORTZ (Philadelphia, Pa.): Of 5925 cases that were treated with sulfapyridine in Pennsylvania, about half were typed, and of that group some thirteen and a half per cent had positive blood cultures. Of the ones that were treated with sulfapyridine and serum combined, 1175 were typed, and around twenty-five per cent of those had positive blood cultures. It is a matter of education. The facilities are available for diagnosis and treatment, and it is up to those in charge to drive home the educational principle of having the doctor make the blood cultures in all severe cases.