

**Remarks on the frequency and character of the pneumonias of 1890 : an address delivered before the New York Academy of Medicine, April 17, 1890 / by William Pepper.**

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**REMARKS ON THE FREQUENCY AND CHARACTER  
OF THE PNEUMONIAS OF 1890.**

*An Address  
delivered before the New York Academy of Medicine,  
April 17, 1890.*

BY WILLIAM PEPPER, M.D., LL.D.,  
OF PHILADELPHIA.

IN attempting to give, in the few minutes at my disposal, a statement of the prevalence and peculiarities of pneumonia as it has presented itself in Philadelphia during the epidemic of influenza, I have tried to secure some reliable statistics by addressing nearly three thousand circulars to the physicians living in Philadelphia. To these I have had 272 replies, each more or less full. Dr. Benjamin Lee, the Secretary of the State Board of Health of Pennsylvania, has kindly given me the following returns, extending up to April 5th, as made to that Board, of the pandemic of influenza :

Total number of physicians giving returns	. . .	187
“ “ adults affected	. . .	19,868
“ “ children “	. . .	8,258
Total	. . .	28,126
Total number of nervous (as per returns)	. . .	5,275
“ “ catarrhal “	. . .	13,249
“ “ inflammatory “	. . .	4,976
“ “ deaths, directly caused	. . .	36
“ “ “ indirectly “	. . .	147
Total	. . .	183
Immediate cause of death, bronchitis	. . .	4
“ “ pneumonia	. . .	86
“ “ phthisis	. . .	24
“ “ nervous symptoms	. . .	12

Through the kindness of my correspondents, to whom I desire to return my sincere thanks for their coöperation in this inquiry, I am able to submit statistics of 35,413 cases reported as above stated by 272 practitioners. From my personal knowledge of the profession in Philadelphia, I am disposed to believe that these figures do not represent a fair average, but that I have secured returns from an undue proportion of those who treated a considerable number of cases; I believe, however, that, so universally prevalent was the disease, not less than two out of every three, or, possibly, three out of every four of the eleven hundred thousand population of Philadelphia suffered from the disease in a greater or less severity. The figures which I have secured are probably sufficiently large to warrant some deductions as to the mortality of the disease, directly or indirectly, and as to the number of cases in which pneumonia appeared as a complication. The number of deaths in the 35,413 cases is given as 257, or 0.72 per cent. Of these 257, 84 are reported as directly due to influenza without pneumonia. Out of the total number of cases of influenza, pneumonia occurred in 1485, with a mortality of 173, or 11.65 per cent. There were also reported as occurring independently of influenza, 2471 cases of pneumonia, with a mortality of 324, or 13.11 per cent. Of these, 1046 are given as croupous, with a mortality of 151, or 14.43 per cent., and 1749 as catarrhal, with a mortality of 173, or 9.89 per cent.

It will be observed that of the 28,126 cases reported to the State Board of Health by 187 physicians in various parts of Pennsylvania, there were only 86 deaths from pneumonia. No mention is made of the total number of cases of pneumonia occurring, although it is probable that under the heading "Inflammatory cases," a considerable number of pneumonias were included. The individual experience of physicians has, however, varied greatly in this respect; thus, one of the most reliable of

my respondents reports 1000 cases, with only three cases of pneumonia, each case of pneumonia terminating fatally. There were 10 other fatal cases, and it may be suspected that in some of these a concealed pneumonia was the cause of death, or at least was coexistent. Another respondent, of the highest distinction as a clinical observer, reported 850 cases of influenza with but 5 pneumonias and not a single death in the entire series. It is needless to say that the experience of those largely engaged in consulting practice is wholly without value from a statistical standpoint, and the same remark must be held applicable to the returns from hospitals.

A more complete notion of the great prevalence of pneumonia during the past season may be obtained from a chart, kindly prepared for me by Dr. Frederick A. Packard from the weekly returns of the Board of Health of Philadelphia. It is seen that during the period embraced between September 7th and December 28th there were, in 1888, 428 deaths from pneumonia, and during the same period of 1889 there were 453, or about an equal number of deaths from this disease; while during the period from December 28th to March 8th the deaths from pneumonia were, in 1889, 459; and, in 1890, 810. There was also a notable, but not equal, difference in the returns of deaths from bronchitis, and it cannot be doubted that the cases of death from pneumonia in 1890 would be further increased by the fact that some such cases are included under the head of bronchitis. In addition to this, the total number of deaths returned as from influenza, without specific mention of pneumonia, is 138, and unquestionably a large proportion of pneumonias are therein concealed. Finally, it will be noticed that during the five weeks from December 28th to February 1st, the number of deaths from pneumonia were, respectively, 71, 145, 182, 131, 82, a total of 611; while during the same weeks of the previous year the figures were, respectively, 44, 50,

38, 34, 55, a total of 221. The maximum number of deaths from pneumonia in one week in the winter 1888-9 was 64—in the week ending March 8th.

In attempting to estimate the relative proportion of the croupous and catarrhal varieties, the returns made to me (and which I must regard as more reliable than the aggregate returns to the city health office) would indicate that the catarrhal were almost twice as frequent as the croupous. It is no argument against this conclusion, as would be expected, when I say that Dr. Da Costa and myself saw at least as many cases of croupous as of catarrhal, in consultation, since this might be explained by the fact that the former were the more severe and dangerous (giving a mortality of 14.43 per cent. as against 9.89 per cent.).

In passing from this merely statistical return to the peculiarities of the pneumonias of the past season, I would first note the large preponderance of cases affecting the right lung. I should be inclined to say that this side was affected at least twice as often as the left. There was also an unusual proportion of cases of apex pneumonia where the entire upper lobe was completely consolidated without implication of any other part. As usual in such cases, there seemed to be a special predominance of cerebral symptoms.

It would appear that the association with pleurisy was even more constant and marked than usual. The side pain was often intense and sudden. The pleurisies were usually plastic; in one case, coming on with pneumonia immediately after exposure during convalescence, aspiration secured a pint and a half of pus on the third day and a few ounces of sero-pus from the pericardium on the following day.

I would offer merely as a suggestion resulting from personal observation that there has been an unusual prevalence of pericarditis, both plastic and purulent, in all probability, in some cases at least, associated with

and preceding influenza. Corresponding prevalence of endocarditis has not been noted.

Jaundice has been observed in Philadelphia in a considerable proportion of cases, especially in those accompanied with pneumonia of the right lung. The evidence as to the cause of jaundice is not conclusive. In the cases where careful examinations were made bile pigment was detected. In the following case (Case I.), which may be quoted in full as typical, there were hæmin crystals found in the first examination of the urine, which was made prior to the development of the jaundice, and subsequently bile pigment was detected. In the only cases where autopsies were made the bile-ducts seemed pervious, although, as is well known, a preceding catarrhal swelling may have subsided just before or after death. Jaundice was certainly a symptom of highly unfavorable omen in pneumonic cases; when it occurred merely in the catarrhal form in influenza not complicated with pneumonia it was not necessarily grave.

CASE I.—N. C., aged twenty-five, unusually vigorous and athletic, was in excellent condition when attacked by a very slight form of influenza. He was not confined to bed at all and took no medicine and did not consult a physician. He stayed in the house but went to his meals, and in four or five days announced that he felt so well that he would go out after dinner to visit a friend a few blocks distant. The night was damp and raw. After sitting and conversing about an hour he was suddenly seized with a violent pain in the right side, which grew so intense that he fell upon the floor and vomited a quantity of blackish matter. It was not said, but it is not improbable that there was blood mixed with it. The vomiting was perhaps induced by brandy and ginger which was given to him. He was taken home in a carriage and I saw him within an hour from the time of the attack, and found him with tem-

perature over  $105^{\circ}$  and with the evidences of the congestive stage of pneumonia of the right lower lobe. He had a hypodermic of morphine to allay pain, took aconite at short intervals during the night with antipyrine and salicylate of sodium, each 5 grains. During the night pain was intense, the respirations were short and gasping and the face wore an anxious expression. The hypodermic of morphine and atropine had to be repeated. The following morning the temperature had fallen to  $103^{\circ}$  and at no time subsequently did it reach  $105^{\circ}$  till just before the fatal ending. Complete consolidation of the right lower lobe developed at the end of forty-eight hours; the cough was painful with rusty sputa; until the fourth day the temperature averaged from  $102^{\circ}$  to  $103^{\circ}$  and the pulse between 90 and 100. The stomach was irritable and retained only very small quantities of liquid. The tongue was heavily coated; the bowels were quiet. The urine was scanty, dark, and contained albumin and granular casts. He was treated with large doses of quinine by suppositories, and repeated half-grain doses of calomel until 10 grains had been taken. At the close of this time, about the fifth day, there were several loose stools of light color. The patient seemed to be doing extremely well and frequently expressed himself as improving. By this time the rapid extension of disease began and soon led to consolidation of nearly all of the upper lobe on the right side while the middle lobe remained free. On the sixth day sudden and violent pleuritic pain developed on the left side, low down, followed by rapid consolidation of the lower lobe, extending upward and producing complete consolidation of the entire lung. Deep jaundice developed on the sixth day and the urine showed the following changes:

*January 12, 1890.* Acid,  $1031$ . No albumin, sugar, or casts. *Evening*—Acid,  $1027$ . No albumin, sugar or casts. Many triple phosphate crystals.

*15th.* Acid, reddish color, 1024. Distinct amount of albumin. No sugar. No casts. No red blood-corpuscles. Teichmann's crystals.

*16th.* No hæmin crystals. Bile pigment detected by Gmelin's test.

*17th.* Acid. Trace of albumin. Bile pigment. No sugar. No casts. A few bile-stained leucocytes.

There were no cerebral symptoms, but a most singular persistence of a feeling of comfort, of strength and of improvement within a few hours before death; with a perfectly clear mind and a natural tone of voice he asserted that he felt well enough to sit up and walk across the room. The temperature rose progressively to 105°, the respirations steadily grew more rapid up to 50 to 60, and the pulse lost strength and grew very rapid. There was increased cyanosis. He died of heart-failure on the beginning of the eighth day. No microscopical examination of the sputa was made. The autopsy showed typical croupous consolidation of the entire left lung and, on the right side, of the entire lower lobe and of scattered patches in the apex. The middle lobe remained entirely free but was not fully expanded. The bronchial tubes were not obstructed; on both sides there were layers of plastic lymph; there was no pericarditis; no ante-mortem clots or valvular lesions. The liver was stained yellow, its tissue presented no marked change to the naked eye and the bile-ducts seemed pervious. No lesions of the gastro-intestinal canal. The blood seemed somewhat more liquid than normal.

Albumin in the urine was, I think, found in nearly all cases of pneumonia where it was carefully looked for, though not rarely there were no casts. Both hyaline and epithelial casts were found in some cases as early as the second day. It is clear that infectious nephritis was a frequent complication of influenza and especially in cases with pneumonia.

Many cases of pneumonia were associated with an



unusual degree of gastro-intestinal irritability. Vomiting frequently occurred spontaneously at the onset and was readily caused by food or medicines during the course of the disease. Diarrhœa was also often easily caused. Both of these symptoms were highly unfavorable. Hæmorrhage from the bowels occurred in one case which came under my observation where there had been marked abdominal distress and fulness. A case is quoted here in full not only on this account but as illustrating peculiar physical signs and nervous symptoms.

CASE II.—Mr. X., aged forty-six, of excellent health, but probably somewhat overtaxed and depressed in vitality, having recently suffered from a very severe carbuncle, had a sharp attack of influenza. His whole family suffered at the same time. He went out and attended to business while still relaxed and with a hard, dry cough. He exposed himself on the evening of January 8th, going out in a damp, raw air and was attacked about midnight with chills, violent pains on the right side of chest, cough, and rapid development of fever. On physical examination there was found an extraordinary weakness of respiratory murmur over the right lung, especially over the two lower lobes. It was scarcely possible to hear the vesicular murmur, and crepitant râle was developed only after cough. Even on the left side there was no compensatory exaggeration of the respiratory murmur. The case developed into typical lobar pneumonia, involving the entire posterior part of the right lung and the anterior part of its lower lobe. There were a few râles at the base of the left lung, but no pneumonia developed there. The temperature never became very high ( $103^{\circ}$ , maximum). The tongue was heavily coated and the stomach was very sensitive, but he was doing apparently well when there occurred sudden collapse with marked heart-failure and abdominal distress, which was explained soon after by several

bloody discharges from the bowels. There had been a great deal of hebetude and mind-wandering before this, and this increased greatly after the pain extended, so that he was desperately ill until the twelfth day, after which improvement began and increased steadily until recovery. The urine showed:

*January 10, 1890.* Acid, 1018. Marked amount of albumin. No sugar. No casts.

*11th.* Acid, 1021. Marked amount of albumin. No sugar. No casts.

*13th.* Acid, 1018. Marked amount of albumin. No sugar. One hyaline and one epithelial cast in three slides.

*15th.* Acid, 1017. Marked amount of albumin. No sugar. No casts.

The pyrexia deserved more critical study than could be given, owing to the excessive pressure of work. I would observe, in the first place, that there seemed to be a highly pyrogenic state of the system widely prevalent throughout the community during the season. I am sure that such observations as the following must be familiar to all: One of my own children, aged five, seemed somewhat dull late in the afternoon, but did not appear at all unwell otherwise. I found his temperature  $104^{\circ}$ . In the case of a child, aged twelve, whose mother is a trained clinical observer, but who merely remarked that the child seemed feverish and dull, but did not need any attention, I found the temperature  $105^{\circ}$ . The pyrexia subsided in thirty-six hours with a development of no local lesion or the evidence of a specific influenza. Naturally, therefore, hyperpyrexia would be expected in complicated cases of influenza, and very many records have been furnished supporting this view. A striking phenomenon was a very rapid rise of the temperature at the commencement of the disease; and not rarely, this initial rise continuing for the first eighteen or twenty-four hours, was followed by a distinct drop with no subsequent

rise equal to the initial temperature. Temperatures of  $105^{\circ}$  and  $106^{\circ}$ , and in two cases of  $107^{\circ}$ , have been reported, the latter occurring toward the fatal close of the cases, one of whom was quite clear in his mind and the other fairly rational. On the other hand, in a few cases strikingly low temperatures were noted throughout the course of the extension of croupous pneumonia. In a case involving all of the left lung except the tip of the apex, and terminating in abscess, the initial temperature reached  $102^{\circ}$  for a brief period, but at no subsequent time was it above  $101\frac{2}{3}^{\circ}$  until hectic fever set in. It is proper here to call attention strongly to the fact that the vast majority of pneumonias occurred as a sequel, rather than a complication, and that they were clearly traceable to exposure to damp and raw weather while the patient had a relaxed system and while slight pyrexia persisted after the subsidence of the more marked symptoms of his influenza. Experience furnishes many instances of this fact. Both the cases above quoted are striking examples. It was not even necessary that the patient should leave the house to meet with this fate. In a marked case which I saw, a man aged thirty-five, heavily taxed with important professional work and depressed by the loss of a favorite child of three with apex pneumonia of a cerebral type, had an ordinary influenza, from which he improved so greatly by the fourth day that, in opposition to his physician's orders, he rose, dressed, and went to his library at some distance from his bed chamber. He soon had a chill, followed by temperatures of  $105^{\circ}$  and  $106^{\circ}$ , with right-sided pneumonia, rapidly developing delirium and deepening stupor, and with rapid and furious convulsions before death, which occurred on the fourth day. The practical lesson taught to all of us by this case must be embodied impressively in the records of this epidemic, and in all future cases of influenza must serve as a most important guide in the management of this disease, especially in this state of convalescence.

Allusion has already been made to the nervous and cerebral symptoms attending the influenza pneumonia of this past season. I am not aware that the cases of pneumonia which occurred unassociated with influenza presented any marked peculiarities in this respect, but, as should naturally be expected, the pneumonias which occurred during or after influenza proved otherwise. In the first place they were often associated with exceptionally severe pain about the chest and with pains in different parts of the body. There is much evidence to show that these pains might be considered partly due to general neuritis or perineuritis of varying degrees of intensity. It is not now the time to discuss the question whether this affection of nerve-trunks was of purely infectious origin or was due to atmospheric influences acting upon systems relaxed and sensitive to an almost unprecedented degree. It would seem, however, that the view of its infectious origin is strongly supported by many facts. The existence of such neural trouble has been made clear in a number of cases by muscular and sensory sequelæ. I refer to it partly in this connection because it has seemed probable to others besides myself that such a condition of the intercostal and respiratory nerves, and possibly of the pneumogastrics themselves, may be invoked to explain not only the chest pains, but the extraordinary weakness of the respiratory murmur noted in so many of our pneumonia cases. Another explanation of this striking phenomenon that has been advanced is the hypothetical enlargement of the bronchial glands. I do not know anything in direct evidence in support of this view, but merely mention as of interest in connection with the matter that Dr. John Todd, of Pottstown, Pa., reports to me that in the cases of influenza occurring in that town there was diffuse enlargement of the lymphatics, even advancing to suppuration. We had no such reports from Philadelphia.

The cerebral symptom which attended the pneu-

monias here were dulness, at times amounting to deep hebetude, or, in the latter stages of fatal cases, coma. In the following case (Case III.) this type of stupor was strongly marked for two days prior to the clear development of physical signs of consolidation. I am doubtful whether the case was one of influenza at all. It is more probable that it was a typical example of the ordinary infectious type of pneumonia, where, as is well known, the constitutional symptoms may precede by hours or even several days the development of the local lesions.

CASE III.—H., aged twenty-two years, an athlete in splendid condition, though overworked and exposed in a malarial district. He had felt unwell for several days but continued at business. On Friday, December 6th, he felt very tired in the evening, but put on evening clothes and went to the theatre with only a light overcoat. He had fever during the night and slept badly, but rose the following morning and went three miles to work, walking one and one-half miles. He had to go home, however, had a hard chill, and when seen that evening had a temperature of  $104\frac{3}{8}^{\circ}$  with evident congestion of the upper lobe of the right lung. He was stupid and heavy, but had scarcely any cough and made no complaint of pain, other than a slight soreness about the right nipple. Consolidation of the right upper lobe was not evident until December 9th. The temperature reached  $105^{\circ}$  on the second day and for five days remained between  $103^{\circ}$  and  $104^{\circ}$ . It began to fall toward the close of the seventh day and by the morning of the eighth day had reached normal. He continued in a state of deep hebetude until the sixth day, but without delirium. Throughout the whole course of the case there were only two slight coughing spells, and only on the fifth day did he raise any sputa and then but two small portions of viscid, rusty-colored exudation. A careful microscopical examination of the blood showed

no plasmodium. The entire upper lobe of the right lung and part of the back of the middle lobe were solid. When the temperature fell there was rapid resolution, with complete absorption without any expectoration. There was abundant herpes at both corners of the mouth. He took 10 grains of quinine the first day and on the second day he took 20 grains in one dose in the morning. The stomach then became irritable and he was treated with carbonate of ammonium, 5 grains every three hours, and antipyrine and sodium salicylate, 4 grains each about three times daily. On the seventh day he took five doses of 5 grains of quinine each. The rapid fall in temperature which followed on the next day was probably in large part a coincidence. Quinine was continued in decreasing doses. He made a complete and rapid recovery. The urine contained albumin but no casts. Chlorides were present on every examination.

Delirium was frequently met with and varied much in type and degree. In many cases there was continual mind wandering and delirium, and such cases were not rarely followed by emotional sensibility and weakness. Another type was of wild and maniacal delirium. This came on in some cases at an early stage, even as an initial symptom; it was sometimes persistent, and in not a few cases there was subsequent temporary dementia. Lastly, in other cases, especially in neurasthenic females or in anæmic and exhausted males, there was an excited delirium with garrulousness and even with hysteroidal phenomena. In other cases there was evident irritation, meningeal or cerebral, with wild excitement, passing into stupor with convulsions; or spinal, with stiffness and retraction of the head, muscle-soreness and hyper-æsthesia.

Finally, in regard to thoracic symptoms. Cough was at times almost or entirely absent (of course, generally in cases where cerebral symptoms were present). In some instances it was almost suppressed, with no

adequate cerebral symptoms to explain it. Ordinarily it was a marked symptom and often severe, paroxysmal, and painful in both croupous and catarrhal forms. I regret to say that there seem to have been in Philadelphia very few careful microscopic or culture studies of the sputa; in the cases where search was made, the pneumococcus is reported to have been found. I am unable to report any new facts in regard to the pneumonic lesions. Certainly in such cases as the first, above reported, the lesions present were to all appearance the typical ones of croupous pneumonia, and the same statement is made of other cases with and without microscopic examination.

There is nothing especial about the sputum except that in cases with little or no cough even extensive consolidation terminated in rapid absorption without expectoration (as in Case III.).

The physical signs were deeply interesting and in many cases were difficult to understand. To such an extent was this the case that I doubt not that in many examinations the diagnosis as to the extent and nature of pneumonia, or even as to the existence of pneumonia at all, was erroneous. The most evident cause of this difficulty was the excessive weakness of the respiratory murmur as above mentioned, and the poor development of all auscultatory phenomena. Further, the co-existence of bronchial catarrh, even in croupous cases, often complicated the physical signs, and not only were the breath-sounds weak in the early stages of congestion, but with complete consolidation the bronchial breathing was at times imperfectly developed.

A careful observer reports that he deliberately punctured a case of croupous pneumonia to establish a differential diagnosis because the bronchial murmur was so feeble as to justify the suspicion that there might be a considerable amount of fluid. Although in many cases of the croupous type there was typical crepitus, it was

often developed only on the deep breathing following coughing. In most cases, also, the râles were coarser and heard somewhat in expiration, though chiefly in inspiration, and in cases which were clearly croupous. After the exudation was absorbed, the affected area continued in some cases for a considerable time to give impaired resonance, weak breath-sounds, and fine expansion crepitus.

CASE IV.—Mrs. W. was seen in consultation with Dr. James Collins. She was a woman in good general health when she was attacked with a slight chill, followed by fever and coughing, which soon became associated with some pain, especially in the right side. There were also pains throughout the body evidently due to influenza. The fever was of the regular type, with a maximum of  $104\frac{3}{5}^{\circ}$  and with daily variations of from  $2^{\circ}$  to  $3\frac{1}{2}^{\circ}$ . At the close of the fourteenth day the temperature reached  $100^{\circ}$ , but did not remain down long as symptoms of increased pulmonary trouble in the form of catarrhal pneumonia developed, and for the next five days the fever ranged between  $100^{\circ}$  and  $103^{\circ}$ , dropping again on the seventeenth day to  $99\frac{2}{5}^{\circ}$ . The next two days presented an even greater range of remission from  $104^{\circ}$  to  $99\frac{2}{5}^{\circ}$ , and the following day rose from  $100^{\circ}$  to  $104\frac{2}{5}^{\circ}$ ; from the eighteenth day to the twenty-eighth day the fever ranged from  $103^{\circ}$  to  $105^{\circ}$ , reaching  $105\frac{1}{5}^{\circ}$  once. It then gradually fell and reached  $99^{\circ}$  on the thirtieth day, and during convalescence did not again rise above  $100^{\circ}$ . From the thirteenth day to the thirtieth day the patient was so ill that her life was despaired of. Both lungs were extensively involved, but at no point was there any considerable area of dulness. The respiratory murmur was extremely feeble and in many places almost inaudible. At other points it was feebly blowing, with prolonged expiration. Percussion resonance on very light percussion gave very irregular results at different points of the pulmonary area. The cough was feeble and



there was very little expectoration. It was not rusty-colored at any time. The pulse was extremely feeble and ranged from 96 to 136. The râles heard were irregularly distributed and at certain points, both anteriorly and posteriorly, there were quantities of small subcrepitant râles. The respirations were not very rapid in comparison with the temperature, the average being from 24 to 26 in a minute. The treatment consisted of nutritious enemata, small doses of morphine with quinine by suppositories, and by the mouth strychnine in large doses with aromatic spirits of ammonia. The patient made a complete recovery.

It is not designed to make any remarks in reference to treatment. The general type of the disease forbade the use of depletives or of depressing remedies. The general course of treatment which seems most useful may be inferred from the cases above reported.

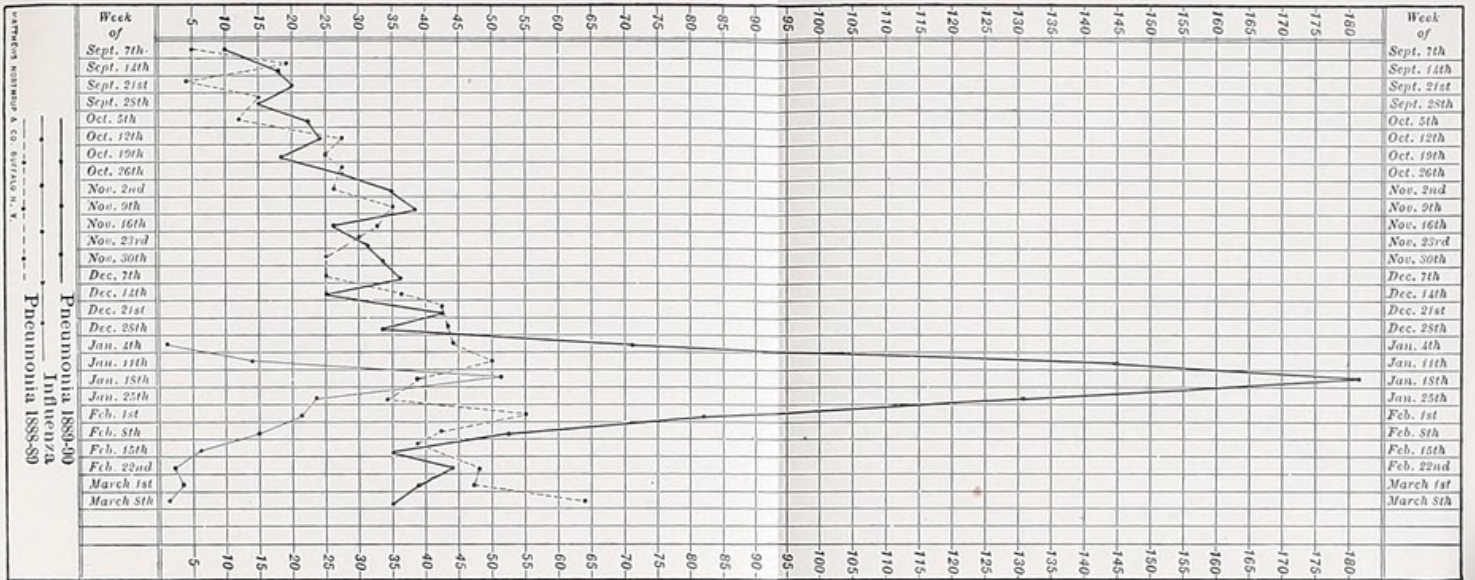


Chart showing the mortality from pneumonia in Philadelphia during the winters of 1888-89 and 1889-90, and from influenza during the winter of 1889-90.

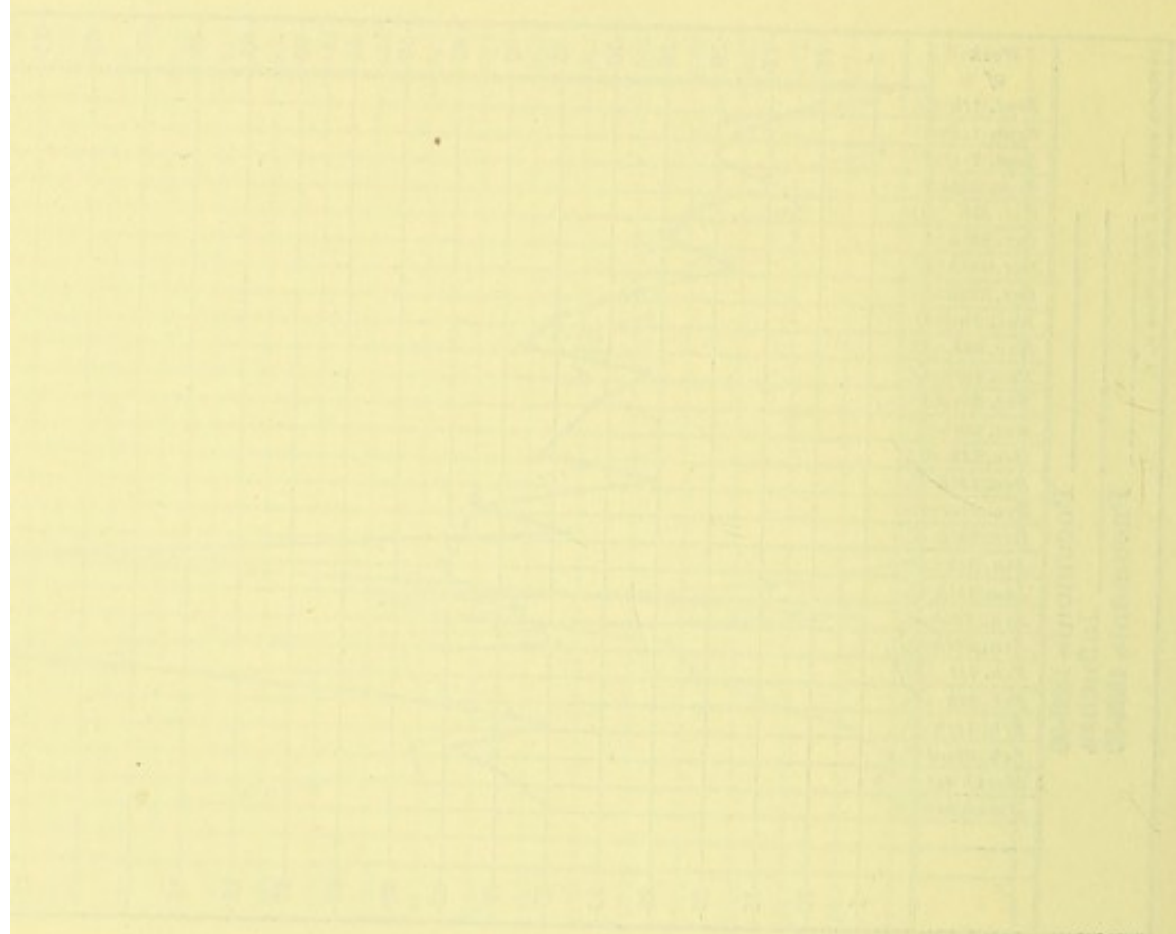


Fig. 1. A graph showing the results of an experiment. The vertical axis is labeled 'Y' and the horizontal axis is labeled 'X'. The data points are plotted as small circles, and a smooth curve is drawn through them. The curve starts at the origin (0,0) and increases as X increases, following a concave-down path.