RECENT MEASURES FOR THE PREVENTION AND TREATMENT OF TUBERCULOSIS.

BY

GUY HINSDALE, M.D.,

MEMBER OF THE AMERICAN CLIMATOLOGICAL AND AMERICAN NEUROLOGICAL ASSOCIATIONS; FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA, ETC.

From Transactions of the American Climatological Association.

1895.

RECENT MEASURES FOR THE PREVENTION AND TREATMENT OF TUBERCULOSIS.

By GUY HINSDALE, M.D.,
OF PHILADELPHIA.

A BRIEF review of the extensive provisions for tuberculous patients abroad shows how far behind America is in the systematic care of this large class of sufferers. I do not, of course, refer to provision for those who are able to command, in addition to skilled medical attendants, the measures that promote recovery, and especially the advantages of favorable climates; but rather the hospital-class, of far greater extent, who need the housing, food, and care that they are unable to purchase. The well-to-do are at least as well provided for here as in Europe; but our State governments have not, to any appreciable extent, definitely helped the dependent class in this regard. The English began to look after the tuberculous more than a hundred years ago. An institution for their relief was established in Kent as early as 1791. The Hospital for Consumptives and Diseases of the Chest at Brompton, which was established fifty-four years ago, now has a capacity of 315 beds and an income of over one hundred thousand dollars. Other hospitals have been erected at Torquay, Bournemouth, and Liverpool; and in 1869 the Royal National Hospital for Consumption and Diseases of the Chest, at Ventnor, Undercliff, Isle of Wight. The last includes twenty buildings picturesquely situated, and has a capacity of 134 patients, and an ordinary income of $57,000. Altogether, England has eighteen institutions of this character, which receive annually between 6000 and 7000 patients.

The Victoria Hospital for Consumption, the first institution of the kind in Scotland, was opened November 22, 1894, and up to May 31, 1895, had received sixty-two patients. At present it is not available for advanced cases.

France has institutions at Berck-sur-Mer, Arcachon, Cannes, Argeles, founded in 1878, Touraine at Ormesson, and Villiers, on the river Marne and Villepinte. The city of Paris has also erected a large sanitarium for indigent tuberculous persons at Angicourt, near Liancourt, fifty miles from Paris, with a present capacity of 100, and provision for enlargement.

Germany has an institution for the tuberculous at Falkenstein in the Taunus, near Frankfort, under the care of Dr. Dettweiler. One at Ruppertshain, in the same neighborhood, is being erected for the accommodation of 75. In 1893 an institution was opened at Rehburg, in Hanover, for the tuberculous poor of Bremen; it has provision for twenty-four beds. In the first ten months 69 patients were admitted and about one-third were able to return to their occupations.

At Malchow, near Berlin, an institution was established in 1892 for men in any stage of tuberculosis. It has a capacity of 100, and cost $50,000. At Gütergotz, also near Berlin, a similar institution for 80 patients is projected; another, to cost 250,000 marks, is to be erected at Reiboldsgrün, at an elevation of 2160 feet, where there is already a small institution for persons of means. The city of Worms is also adopting similar measures for its tuberculous; so also in Würzburg plans are being formed to erect a sanitarium at Spessart. At St. Andreasburg and Blankenhain in the Hartz Mountains, and at St. Blasien in the Black Forest, successful institutions are conducted.

At Vienna Prof. Schrötter has made great efforts to have an institution established, and, with very liberal help on the part of Baron Rothschild, who has offered lands and money, his plans will be carried out. At Munich, Lübeck, Hanover, and Stettin similar institutions are being planned, and in Turkey an institution for the children of tuberculous parents is being established on the Bosphorus.

Much of the encouragement toward action on the part of municipalities has come from the remarkable success in the treatment of tuberculosis that has been obtained in private hospitals. Brehmer, who established his sanitarium at Görbersdorf, in Silesia, in 1854, reported after the first fifteen years that 20 per cent. of his 958 tuberculous patients had been permanently cured. Charles Theodore Williams recently stated that of 247 patients, chiefly in the early stages of the disease, who had been sent to the private Alpine Sanitaria, chiefly Davos, St. Moritz, and Arosa, "a cure was effected in 101, or 40.89 per cent.; great improvement in 73, or 29.55 per cent."

Subscriptions have been recently started at Bâle for a sanitarium for the phthisical poor at Davos. The institution is expected to be opened in July, 1896, and the city of Bâle has agreed to maintain a special hospital for the reception of a number of its consumptive poor.

Dr. Trudeau, in the last annual report of the Adirondack Cottage Sanitarium, which has just completed its tenth year of existence, states that from 20 to 25 per cent. of the patients have been apparently cured after a prolonged residence; cases in which the rational signs of pulmonary tuberculosis and the bacilli in the expectoration have been absent for three months or more, or in which there is no expectoration at all; any abnormal physical signs remaining being interpreted as indicative of a healed lesion. This, I may say, is still the only institution in this country that is strictly built on the cottage-plan. Two new buildings have been erected during the past year. The sanitarium has now twenty-two buildings, with accommodations for eighty-four patients. It has a free-bed fund of $14,000, through which it gives aid to the very poor, and an additional $25,000 has been put aside toward a permanent endowment-fund.

The new sanitarium at Paul Smith's in the Adirondack Mountains, at an elevation of 1800 feet, is nearly ready for the reception of patients. This institution is called the Sanitarium Gabriels, and will accommodate fifty persons. It will

be under the care of the Sisters of Mercy of the Roman Catholic Diocese of Ogdensburg, but is intended to be non-sectarian as regards the admission of patients. Dr. W. Seward Webb and Paul Smith have given 100 acres of land for a site, and Governor Morton and others have made handsome donations. An infirmary, an administration-building, and a half-dozen cottages are included in the plans. The first will be a handsome structure, two stories in height and built of wood and stone, with a glass-enclosed solarium and arrangements for the open-air method of treatment. A nominal charge will be made for treatment.

A recent movement in New York City to erect a memorial to the late Alfred L. Loomis, a former President of the American Climatological Association, has met with a liberal response. Already one gentleman has contributed $65,000 toward the proposed sanitarium for tuberculous persons now being erected at Liberty, Sullivan County, New York, in memory of our lamented friend. The plan includes a central building, with a number of surrounding cottages; two of these at a cost of from $3000 to $5000 apiece are being constructed on a plot of 190 acres. The elevation is 2000 feet, and is reached by rail in five hours from New York City.

New York has also a large institution, the Seton Hospital, for tuberculous patients, at Spuyten Duyvil, near the Harlem River. It has accommodations for two hundred, but at present has only thirty-two patients. The State of Massachusetts has recently appropriated $150,000 for a similar institution. Colorado has three such institutions: the Glockner Sanitarium, with a capacity of forty; the Bellevue Sanitarium, with a capacity of twenty-five, which, however, is not open at present, through lack of funds for maintenance; and St. Mary's Sanitarium, at Pueblo.

We have in Pennsylvania the Home for Consumptives at Chestnut Hill, a rural district of Philadelphia, that received during the last year ninety-one consumptive women. This institution has a new building in course of construction for the reception of twenty additional patients. It has a choice

situation, a liberal support, and about one-third of its patients are discharged each year improved.[1]

The Pennsylvania Society for the Prevention of Tuberculosis was organized April 10, 1892. Its object is the prevention of tuberculosis, first, by promulgating the doctrine of the contagiousness of the disease; second, by instructing the public in the practical methods of avoidance and prevention; third, by visiting the tuberculous poor and supplying them with the necessary materials for protecting themselves against the disease, and instructing them in their use; fourth, by furnishing the tuberculous poor with hospital-treatment; fifth, by co-operating with Boards of Health in such measures as they may adopt for the prevention of the disease, etc.; sixth, by advocating the enactment of appropriate laws for the prevention of the disease.

Efforts have been made by the Society to have tuberculosis placed upon the list of diseases returnable to the Philadelphia Board of Health, and to empower the Board to disinfect houses in which deaths from this disease have occurred. Similar measures have been carried out in New York City for the past six months with success, and are now compulsory in the city of Buffalo, N. Y., where the Department of Health is adopting energetic measures toward the prevention of tuberculosis. Since June 15, 1895, all cases of tuberculosis occurring in the practice of any physician in that city must be reported to the department. On receipt of such notice a circular of information is sent to the families or those in charge of the patient, giving strict rules as to sanitation, etc.

Recognizing that the consumption of meat and milk from tuberculous animals is one of the frequent sources and modes of tuberculous infection of the human being, especially of bottle-fed infants and children of tender age, the Pennsylvania Society resolved to urge upon the Legislature of the State the necessity of the early enactment of laws to secure the exclusion

[1] The good work of this institution will soon be greatly increased by a recent bequest of a private estate of fifty acres at Oakbourne, twenty-five miles from Philadelphia, and an accompanying legacy of upward of $200,000.

of the meat and milk of tuberculous animals from this Commonwealth. Under these laws about 500 living cattle and a large number of fresh carcasses have been condemned as unfit for the dairy and the market.

June 1, 1895, a new law, establishing a State Live-stock Sanitary Board, went into effect. This Board is composed of the Governor, the Secretary of Agriculture, a Dairy and Food Commissioner, and the State Veterinarian. To administer this law an appropriation of $50,000 will be at the disposal of the Live-stock Sanitary Board during the next two years, for dealing with the various contagious and infectious diseases, and for the first time in the history of Pennsylvania there will be a conservative and systematic plan of dealing with these diseases.

It is interesting to note in this connection that the Royal Commission on Tuberculosis reported in April, 1895, to the British government the conclusions of its important investigations, namely, that it is satisfied that the cause of an appreciable part of tuberculosis in man is conveyed through his food—*i. e.*, the meat of tuberculous cattle. The Commissioners believe that the danger lies not only in diseased organs unremoved in the dressing, but also in conveying to healthy parts tuberculous matter by means of the knives and clothes used by the butchers in dressing.

The Society for the Prevention of Tuberculosis has widely distributed its tracts, namely, 50,000 of tract No. 1, entitled "How to Avoid Contracting Tuberculosis;" and 40,000 of the other, entitled "How Persons Suffering from Tuberculosis Can Avoid Giving the Disease to Others." A great interest has been taken in the Society by physicians in all parts of the world. Boards of Health in almost every State in the Union have made application for these tracts, and have been supplied. Within a few weeks a request from Boston for 500 tracts and from San Francisco for the same number were received and very gladly complied with. Physicians in all parts of the South and West, in various portions of Canada, and even so far as the Hawaiian Islands, have made application for them.

Vigorous efforts were made during the past winter to secure the establishment in Philadelphia of a Municipal Hospital for the tuberculous poor. A committee of the Society also visited Harrisburg to urge the necessary State legislation to establish a State Sanitarium for tuberculous persons, to be located at a favorable elevation in the mountainous portion of the State. As a result of this visit the State Board of Public Charities of Pennsylvania recommended to the Legislature an appropriation of $50,000 to carry out the provisions of the bill. While these measures have not yet been successful, there is good reason to believe that the State will take the matter up as soon as some other important charitable measures, as, for instance, the new school for feeble-minded children in Western Pennsylvania and the new hospital for the epileptic insane, are accomplished.

The Society meets annually on the first Friday in May. Any person who pays one dollar or more into the treasury of the Society will be enrolled as a member for the year in which such payment is made. The by-laws provide that all money in the treasury, beyond that which is necessary for defraying the general expenses until the next meeting of the Board, shall be set aside for the use of a Hospital Fund. When the money in the Hospital Fund shall amount to $150 or more a tuberculosis patient shall be placed in a hospital for every $150 in the Fund.

There is no doubting that, as a result of the influence of this Society, of the American Climatological Association, and of kindred organizations, and the issuing of so many thousands of tracts disseminating the principles of the communicability of tuberculosis and the best means of preventing it, the people of the United States are beginning to take very much more interest in the tuberculous patient personally, and that they see the necessity of organized effort to lower the mortality and eventually stamp out the disease. The city of Philadelphia, at least, is showing a marked response to the efforts made to lower the death-rate from tuberculosis. In this city, notwithstanding its growth in population, the actual

number of deaths from pulmonary tuberculosis has gradually diminished since 1880. There were in each 100,000 of population 342 deaths from this cause in 1870, 317 in 1880, 264 in 1890, and only 220 in 1894.

We cannot tell in the State of Pennsylvania just how the mortality is tending, owing to our deficient system of registration; but we know that in Philadelphia there are about 6000 sick with tuberculosis, and in the State at large about 20,000 have the disease. In New York State the ratio of deaths from tuberculosis to the total deaths has steadily fallen since 1890. These facts are significant of the change that has come over the profession in the manner of looking at the disease and of treating it, and also of the attitude of the public itself, which is rousing from its long indifference. The people need plain teaching on this point, for most of them cling to the traditional idea that tuberculosis is strictly an hereditary disease, and consequently unpreventable. The large majority of people do not yet believe that it is contagious, and although, when requested, some persons may observe some of the sanitary precautions we advise, they do it often in a perfunctory manner. The other members of the family, who frequently take little account of the idea of the contagiousness of tuberculosis, do not co-operate in carrying out these measures. Greater efforts must therefore be made to reach the people.

More societies for the prevention of tuberculosis should be organized. We need to organize and maintain special hospitals and cottage sanitaria for tuberculosis. The first step is to find out the localities where medical measures will receive the greatest aid from natural resources—from air and altitude and sunlight. The patient who is weakened in body, deprived of his usual means of livelihood, face to face with a long illness, with little to supply for himself or his family the necessaries of life, not to speak of other needs relating to his disease, needs special help, and it is no wonder that little can be done in our cities to stay the course of this disease. The best solution of the problem, I believe, will be to take these

afflicted beings out of cities to brighter skies and evergreen forests, where nature and art, hand in hand, may work together for their good, and, it may be, for their final cure.

DISCUSSION.

DR. BEVERLEY ROBINSON: Statistics from distinguished observers in sanitariums may present to our minds what is absolutely scientific, but there is a kind of practical experience which doctors in more or less general practice, with a good sprinkling of phthisis, are obliged to have and to form their own conclusions concerning. There are a few facts with which I am personally familiar and, without being derogatory to two noble institutions with which I have been connected, I will state.

I was connected for a period, certainly twelve or thirteen years, with the New York Hospital, out-door department; I had a throat class and a heart and lung class. I lived for several hours, three times a week, in a little room which I believe was never thoroughly disinfected; it was clean, in a certain way, it is true. There were many men there who did not come as patients who have breathed the air of that room, yet not a single one was known to have taken phthisis there. I do know of more than one who, under present theories, had a perfect right to take it. I do not know of one who did. Why not?

I speak of my observations in private practice, also. Technically speaking, I believe tuberculosis to be contagious. Practically, it is very slightly so, I believe.

We may illustrate this by reference to other diseases with which we are familiar. In a paper I read before the Association of American Physicians and Surgeons last year I reported, from a letter written to me by Dr. White, who was at that time resident physician in the Diphtheria Hospital in New York, in which he made the absolute statement that no case of diphtheria was known to have been taken in that institution. Therefore, to his mind, there was no proof of its contagiousness through the air, yet we know how satisfied the majority of us were with the idea of contagion in that disease after this manner. There is a microbe of diphtheria, formerly regarded as specific; now we know that microbe may be found in relatively healthy mouths.

Regarding the origin of pulmonary tuberculosis, we do not doubt it is connected with a form of bacillus. But I do believe there is a cer-

tain habitat connected with this bacillus, about which we know nothing, which at times is highly pernicious and at times is not. I have now a patient who has any number of bacilli in his sputa, and yet I have received lately a long letter from him stating he is very well. From my private practice, giving thereto much careful observation, I do not get such results always as these scientific institutions report.

Second, I am connected with another institution, *i. e.*, St. Luke's Hospital, New York, an institution for which I have only good to speak, as I had for the New York Hospital. In this institution, St. Luke's Hospital, we do the best we can for our phthisical patients. We feed them well, care for them well; we give them what we consider advisable in the way of drugs. And I must confess that, so far as the amelioration of the phthisical condition is concerned, I do not see how large municipal institutions are going to do very much better.

The reason the public are so little alarmed is not because the public are so little acquainted with the facts; but there is a little hard headedness outside of the medical profession, which the medical profession cannot always control. They do not think it is absolutely and always true, any more than I, that there is a region specially suited for consumptive patients. For instance, I know that the Adirondacks, in certain regions, is not better for them than many other places. I know this from reports which come to me from thoroughly well-informed, bright men who tell me in regard to their surroundings there. These sanitariums are often made, supported in fact, by some man of great courage, great perseverance, indorsing, upholding, and praising certain places. Far be it from me to cast a shadow of reflection upon the late distinguished man who once presided over this assembly; yet it was the strong personality of Prof. Loomis that made in part the great fortune and credit of the Adirondacks. Many places in the Adirondacks are damp, and anything but adapted to consumptives. I have reason to believe that such a place as Sharon, New York, where the soil is porous, the air all that could be desired, etc., if you could weed out certain conditions, you have in it as good a sanitarium as any through the Adirondack region.

I must, in some sense, indorse Dr. Quimby. In the last few years there has been a strong tendency to push what we consider strictly scientific opinion and observation, and to throw aside the common-sense views of the vast multitude of observers in the profession and outside. There was a wise and witty Frenchman (Voltaire), who said: "The reason of all the world is a little better than the reason of any one man." And I am of the opinion that this reason of the multitude would at times be a better and surer guide than the *ipse dixit* of the pure scientist.

Dr. Frederick I. Knight: I wish in this connection simply to

mention a matter which I am going to bring up at the business meeting to-morrow; that is, a resolution in regard to the importance of the establishment of hospitals for tuberculosis. The necessity for such a resolution came home to me with force recently when I was before the Finance Committee of the Massachusetts Legislature with reference to this very subject. The question was put to me, Have the medical societies of the country made any formal declaration which has been put on record, in regard to the establishment of such hospitals? Fortunately I could reply that some of our societies had made such a record.

I was astonished to see how readily these men—most of them politicians—took to the hospital idea, not only showing sympathy with homeless patients, but with the idea of preventing the spread of a disease which was communicable. To our surprise, on our first effort, both houses passed an appropriation of $150,000, which was signed by the Governor, for the establishment of a hospital for the consumptive poor.

Certainly, if the disease is infectious, we must make provision for the poorer classes of patients, who are unable to care for themselves and who do spread the disease right and left.

I should have been glad to have had such a document as Dr. Hinsdale's to present to that committee. I understand that in England the practitioners really feel that the disease has been very materially diminished by their hospital accommodations, which have been greater than in any other country so far. I should like to know if any other State has made an appropriation for this purpose. I know an effort has been made in one or two, but I am not aware that any other State has really come up to the mark as Massachusetts has this year.

The resolution will come up to-morrow at the business meeting.

Dr. E. O. Otis: I should like to add one word. When we appeal to a philanthropic public for their money and their aid, and their encouragement to the establishment of hospitals for phthisical patients, it seems to me our first idea should be to help the largest number. For one incipient case we have ten of more or less advanced who apply for care and aid, and these latter cases should receive the first attention. I must confess I am a little tired of the appeals for hospitals and sanitariums for incipient cases. It seems to me if it is to be a pure charity, it should be to the largest number of sufferers, the advanced and tubercular cases, to which our first attention should be given, or at least they should have an equal chance with the incipient ones.

Dr. F. I. Knight: In view of what Dr. Otis says I should like to state that I, at first, was in favor of the incipient cases; but after talking with some of the legislators I began to see that the general sentiment was to take care of the man in his dying days, and I think that

is the correct plan. I believe that where the State is called upon to aid, certainly it ought to look after those helpless, in the worst stage, and not only after incipient cases. But the two classes should be kept strictly distinct.

Dr. C. E. Quimby: I speak on this subject with a great deal of reluctance. While I do not wish to be considered old-fashioned or behind the times, or pessimistic, I recently have come to stand in a very different position toward it. I am willing to admit that tuberculosis is dependent upon the tubercle bacillus and transferable from man to animals and back again, and that, scientifically, it is as contagious a disease as is smallpox.

Having admitted all that, I very much question whether we are on the right track, and whether the prevention and stamping out of tuberculosis is not to be marked by the death-rate. It is a question whether all we are doing is not simply to collect tuberculosis and distribute it in large quantities.

The hospitals we build are for poor people. Now, to my mind, consumption is largely a question of cash; it depends much on right living; that a man has had enough to eat throughout his prenatal period and throughout his own life is a most important factor for the prevention of tuberculosis.

Of these patients from sanitaria who are reported cured and go back to the city, 90 per cent. are practically certain to develop tuberculosis again. All we accomplish is to spend our money and send them back to scatter their sputa about. Statistics show that of those in the earlier stages 20 per cent. are arrested for a time, and then sent back to start up the disease again; 40 per cent. more are made easier, and the time during which they spread tubercle bacilli is increased, while in the end their lives are not saved.

I admit that this brings us apparently to a hard-hearted position; yet I have no question that this is the position which we must eventually assume. It is upon this that I have put forth effort to establish not a hospital, but a dispensary, where patients who must work, and who are working, can be cared for. Through the kind support of Dr. Loomis that was established a year ago, and cases are treated there as dispensary patients. We have two sets of hours, forenoon and evening hours, for those who cannot leave their work. They come for treatment during the office hours. We have averaged during the last year something like three hundred treatments per month with the cabinet to this class of patients. I have not cared at present to give statistics from those cases, until we can have something more than the report of a year. I may say, as a matter of general report, that nearly all patients have been helped. Some have been helped for a time and then passed into the second stage. A good many have been turned back to the point where they do their work with ease and comfort.

I question whether the speediest solution of the question is not to build hospitals for hopeless cases, putting them in such hospitals, and with lots of food—and lots of morphine, if that helps the matter any—make as easy as we can their passage from life.

It may be that is a heartless position. It does not seem so to me, because in this way we shall not only cull out those cases which may be put out into active life again, but leave such cases in active work, taking the sources of infection away from them rather than them from the infection.

The hospital started at Liberty is not on this line, however. Hopeless cases come daily, and I am compelled to turn them back on the streets. Now, the hospital that is built for the *hospital* consumptive, takes him in and recognizes him as a hopeless consumptive and treats him so, is, to my mind, the height of Christian charity.

I hope I shall not seem to you unreasonable or unjust in this matter. I hesitate to say it, yet it has been on my mind for a number of years, since I have seen a good deal of phthisis, and a good deal that comes back from sanitariums.

Dr. Thomas Darlington, Jr.: Dr. Hinsdale's paper brings to my mind an evil. In the northern part of New York City there are some large tracts of land held by moneyed men, waiting for the advance of the city; and these tracts are let out in small divisions for the purpose of feeding cattle. Some are of ten or twelve acres, one is of fifty acres, all within New York City. In the midst of these tracts is a new consumptive hospital—the Seton Hospital. Opposite is a field in which fifteen cows are kept. The consumptive patients from the hospital go over to the field and play quoits, and the field is literally covered with sputa. Here the cows feed. I am much interested in watching the result on the consumers of the milk.

Dr. Guy Hinsdale: I might have referred to one or two other institutions in my paper; that is, to the Sanitarium at Sharon, Massachusetts, also to Winyah Sanitarium at Asheville. The Seton Hospital, of which I spoke, is located at Spuyten Duyvil, N. Y., and has been open only six months; thirty-two patients are under treatment; in all ninety have been received, two-thirds of whom were free. There are four endowed beds; the institution has a capacity of two hundred. The hospital is intended for those in a curable stage, and is under the care of the Sisters of Charity.

TABLE III.

Mortality from Consumption in Philadelphia by Wards, 1860–1885.

Prepared by Guy Hinsdale, M. D.

	1st Ward.	2d Ward.	3d Ward.	4th Ward.	5th Ward.	6th Ward.	7th Ward.	8th Ward.	9th Ward.	10th Ward.	11th Ward.— Delaware front.	12th Ward.	13th Ward.	14th Ward.	15th Ward.— Schuylkill front.	16th Ward.— Delaware front.	17th Ward.	18th Ward.— Delaware front.	19th Ward.— Kensington.	20th Ward.	21st Ward.— Manayunk.	22d Ward.— Germantown.	23d Ward.— Frankford, etc.	24th Ward.— West Philadelphia. *Includes 34th*	25th Ward,— Bridesburg, etc.	26th Ward.— Schuylkill front.	27th Ward.— West Philadelphia.	28th Ward.— Falls of Schuylkill.	29th Ward.	30th Ward.— Schuylkill front.	31st Ward.— Delaware front.	CITY.
No. of persons to 1 acre, 1880, . . .	122	101	149	128	79	48	110	70	49	101	96	119	112	147	71	100	128	70	61	92	4	3	1	8	4	70	3	9	45	85	68	10
Area in square miles, ...	5.51	.442	.191	.229	.321	.321	.439	.435	.400	.359	.210	.193	.259	.237	1.05	.281	.251	.650	.742	.734	7.13	18.1	42.7	9.72	13.6	7.48	11.7	6.35	1.4	.519	.713	129
Census, 1860, ...	30,886	29,123	19,929	23,461	24,792	14,882	31,267	27,770	17,196	21,849	16,681	16,681	20,045	24,258	32,091	20,067	23,264	20,441	38,828	29,963	17,159	17,173	23,985	23,738	. . .	. . .	Includes almshouse.	. . .	. . .	. . .	. . .	565,529
One death in every	*324*	*288*	*390*	*225*	*349*	*513*	*252*	*356*	*373*	*420*	*439*	*407*	*371*	*411*	*386*	*417*	*261*	*365*	*310*	*356*	*612*	*520*	*631*	*339*							*371*	
Census, 1870, ...	25,817	30,220	19,149	20,852	18,736	12,064	31,558	22,286	16,629	23,312	14,845	15,771	19,956	22,643	44,650	19,256	21,347	26,366	45,240	56,642	13,861	22,605	20,888	24,932	18,639	36,603	19,385	10,377	See 20th w.	. . .	. . .	674,022
One death in every	*305*	*262*	*308*	*198*	*217*	*502*	*269*	*305*	*291*	*315*	*345*	*328*	*376*	*404*	*337*	*291*	*236*	*271*	*337*	*348*	*631*	*411*	*455*	*351*	*465*	*312*	*365*	*546*			*292*	
Census, 1880, ...	43,085	28,498	18,271	18,853	16,368	10,004	31,087	19,545	12,481	23,363	12,930	14,690	18,646	22,364	47,865	17,802	20,451	29,354	43,887	43,207	19,699	31,798	26,522	46,057	36,104	35,138	23,284	34,442	40,787	29,100	31,308	846,980
One death in every	*274*	*274*	*253*	*248*	*197*	*254*	*223*	*300*	*290*	*440*	*461*	*459*	*396*	*406*	*332*	*323*	*217*	*222*	*315*	*357*	*579*	*496*	*402*	*407*	*469*	*362*	*264*	*492*	*283*	*281*	*377*	*314*
Highest elevation in feet, ...	24	28	31	34	31	37	42	43	43	41	34	36	43	72	106	34	32	27	99	89	430	440	240	292	133	38	114	255	113	40	37	

Wards 1st–6th: LOWER DELAWARE RIVER FRONT. Wards 7th–10th: SCHUYLKILL FRONT.

Males.	Females.	Under 5 years.	5 to 10 years.	10 to 15 years.	15 to 20 years.	20 to 30 years.	30 to 40 years.	40 to 50 years.	50 to 60 years.	60 to 70 years.	70 to 80 years.	80 to 90 years.	90 to 100 years.	Total.
786	837	53	20	31	109	538	365	238	143	89	28	7	1	1,523
910	907	125	26	24	242	475	423	277	169	115	44	12	. .	1,817
961	988	108	32	26	127	608	445	269	172	103	51	8	. .	1,949
966	989	70	20	23	128	585	489	307	172	108	47	6	. .	1,955
1,087	1,002	117	21	25	143	612	513	335	170	106	39	8	. .	2,089
1,020	1,006	111	21	18	164	613	463	279	194	123	44	6	. .	2,026
994	950	73	24	19	143	585	474	286	189	108	47	5	1	1,944
942	1,005	72	19	33	153	593	451	297	170	114	35	10	. .	1,947
1,000	995	79	19	34	142	583	515	308	167	96	45	7	. .	1,995
982	993	77	16	26	151	628	475	289	163	103	39	6	2	1,975
1,118	1,190	84	18	31	170	681	548	366	231	116	55	7	1	2,308
1,099	1,138	61	14	29	156	720	573	326	201	103	47	9	. .	2,237
1,167	1,163	81	13	40	175	733	547	355	190	126	54	14	2	2,330
1,093	1,199	70	12	28	187	715	547	329	217	128	49	10	. .	2,292
1,133	1,171	63	31	17	133	699	547	355	218	123	59	8	1	2,304
1,185	1,174	51	17	22	189	722	578	377	219	133	46	4	1	2,359
1,289	1,388	64	16	25	217	786	688	445	239	136	52	8	1	2,677
1,142	1,207	50	17	32	180	754	585	364	203	111	46	5	2	2,349
1,154	1,337	54	15	28	211	735	647	361	236	142	56	5	1	2,491
1,233	1,248	49	11	29	196	765	609	349	240	155	57	11	1	2,481
1,325	1,367	54	16	34	196	877	634	421	241	151	58	7	1	2,692
1,358	1,410	64	11	32	199	900	684	441	230	147	56	4	. .	2,768
1,382	1,427	58	22	27	177	938	682	407	276	153	62	9	. .	2,809
1,343	1,455	65	10	18	203	895	668	445	264	150	66	13	1	2,798
1,395	1,406	85	14	31	208	845	711	414	258	149	72	13	1	2,801
1,346	1,475	57	26	40	193	928	671	411	250	155	74	14	2	2,821
29,480	30,427	1,895	649	722	4,492	18,513	14,532	9,051	5,422	3,243	1,328	216	19	59,907
49.6	50.4	3.15	1.08	1.20	7.47	30.80	24.19	15.06	9.02	5.40	2.21	.37	.03	

Almshouse.	Colored.	United States.	Foreign.	Unknown.	1st Ward.	2d Ward.	3d Ward.	4th Ward.	5th Ward.	6th Ward.	7th Ward.	8th Ward.	9th Ward.	10th Ward.
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
154	139	1,008	613	196	95	101	51	104	71	29	124	78	46	52
124	149	1,127	630	192	125	108	55	92	77	41	118	66	45	95
110	161	1,119	689	147	124	124	69	86	72	43	123	78	47	49
113	212	1,240	699	159	120	95	69	93	92	67	130	70	53	79
133	186	1,241	639	146	68	109	65	109	57	36	131	73	51	62
131	172	1,119	672	153	48	98	68	83	76	48	129	83	61	53
101	160	1,148	681	118	63	113	65	81	85	34	139	80	57	57
99	133	1,202	665	128	83	105	50	84	66	33	137	47	75	58
. . .	. . .	1,214	674	87	61	100	66	92	76	30	119	63	54	61
125	153	1,406	732	170	73	115	62	105	86	24	117	73	57	74
95	154	1,381	732	124	73	101	71	78	59	38	144	52	70	59
114	171	1,450	734	146	98	133	67	77	69	46	143	71	44	69
131	187	1,392	729	171	83	100	73	90	64	29	105	68	36	59
97	154	1,412	759	133	85	80	60	85	52	31	127	70	46	47
119	168	1,496	715	148	99	97	72	83	63	39	125	91	44	76
175	219	1,657	818	202	100	100	57	109	67	33	141	77	46	61
135	183	1,508	689	152	120	112	56	84	58	33	130	59	24	55
95	201	1,604	766	121	106	112	57	77	57	27	118	73	40	65
100	182	1,545	801	135	139	104	63	70	78	41	115	67	36	50
75	205	1,816	767	109	157	104	72	76	83	39	139	65	43	53
91	215	1,858	789	101	155	100	68	67	83	33	149	66	37	62
96	198	1,877	797	135	136	104	68	81	80	37	124	50	28	55
. . .	199	1,890	796	112	130	100	62	86	83	29	123	49	29	52
. . .	207	1,893	838	70	140	122	80	76	84	35	112	44	28	55
. . .	219	1,915	769	137	135	93	63	86	86	38	123	62	30	74
. . .	4,327	. . . .	18,189											

11th Ward.— Delaware front.	12th Ward.	13th Ward.	14th Ward.	15th Ward.— Schuylkill front.	16th Ward.— Delaware front.	17th Ward.	18th Ward.— Delaware front.	19th Ward.— Kensington.	20th Ward.
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
38	41	54	59	83	48	89	56	125	84
41	46	76	117	54	72	69	125	101	27
38	41	71	87	125	49	78	51	95	92
37	40	47	76	145	51	86	55	107	109
42	51	53	66	108	42	71	62	110	104
46	42	43	55	101	56	69	64	102	119
37	45	48	74	102	59	63	55	87	133
32	42	46	60	115	49	75	87	123	130
39	47	50	56	110	48	77	72	134	130
43	48	53	56	132	66	90	97	134	165
44	46	46	51	147	42	75	70	181	184
33	33	36	71	136	43	57	88	179	130
34	42	42	51	127	44	77	106	187	109
43	43	40	74	145	29	82	91	224	140
49	38	46	48	114	43	89	79	204	119
51	40	45	74	157	56	85	93	159	131
34	29	50	59	120	59	74	115	130	97
39	45	48	71	141	49	79	100	143	108
37	27	50	56	136	34	88	110	143	105
28	32	47	55	144	55	94	132	139	121
43	42	55	68	142	62	81	107	133	117
49	45	59	45	138	61	71	104	141	142
42	49	49	67	153	48	83	113	134	139
31	49	49	50	126	48	76	104	170	115
45	45	47	66	136	38	67	87	149	157

21st Ward.— Manayunk.	22d Ward.— Germantown.	23d Ward.— Frankford, etc.	24th Ward.— West Philadelphia.	25th Ward,— Bridesburg, etc.	26th Ward.— Schuylkill front.	27th Ward.— West Philadelphia.	28th Ward.— Falls of Schuylkill.	29th Ward.	30th Ward.— Schuylkill front.	31st Ward.— Delaware front.	CITY.
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	
28	33	38	224	38	. . .	. . .	. . .	. . .	. . .	. . .	
38	33	19	14	23	. . .	. . .	. . .	. . .	. . .	. . .	
38	36	52	198	23	. . .	. . .	. . .	. . .	. . .	. . .	
30	66	41	238	25	. . .	. . .	. . .	. . .	. . .	. . .	
39	61	51	235	31	69	. . .	. . .	. . .	. . .	. . .	
37	46	44	210	28	65	. . .	. . .	. . .	. . .	. . .	
23	45	53	60	28	73	127	. . .	. . .	. . .	. . .	
27	33	40	64	37	93	131	9	. . .	. . .	. . .	
20	43	41	63	35	99	102	10	. . .	. . .	. . .	
27	55	48	71	40	117	178	19	. . .	. . .	. . .	
23	54	51	66	39	110	162	14	. . .	. . .	. . .	
31	49	50	66	53	121	188	19	49	. . .	. . .	
25	59	56	95	47	132	190	22	76	. . .	. . .	
34	55	68	85	55	134	151	28	73	. . .	. . .	
27	54	49	96	51	162	166	36	100	. . .	. . .	
40	68	40	119	82	122	245	42	97	66	74	
25	60	48	88	74	76	204	42	86	66	76	
49	65	56	110	87	97	167	49	102	75	79	
41	60	75	91	70	85	186	64	116	75	69	
34	64	66	113	77	97	163	70	144	103	83	
28	74	60	141	89	110	177	78	128	96	95	
53	89	85	13	118	114	223	68	130	80	101	
33	80	59	149	124	121	200	87	141	104	80	
55	95	56	148	112	114	223	73	139	97	95	
40	111	55	147	116	107	205	93	136	89	95	

2834
'87 2808
'88 2695
'89 2532
'90 2764
'91

378 1,046964