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BUREAU OF THE CENSUS
S. N. D. NORTH & DIRECTOR

TUBERCULOSIS IN
THE UNITED
STATES



PREPARED FOR THE INTERNATIONAL CONGRESS ON TUBER-
CULOSIS, WASHINGTON, SEPTEMBER 21 TO OCTOBER 12, 1908

DEPARTMENT OF COMMERCE AND LABOR

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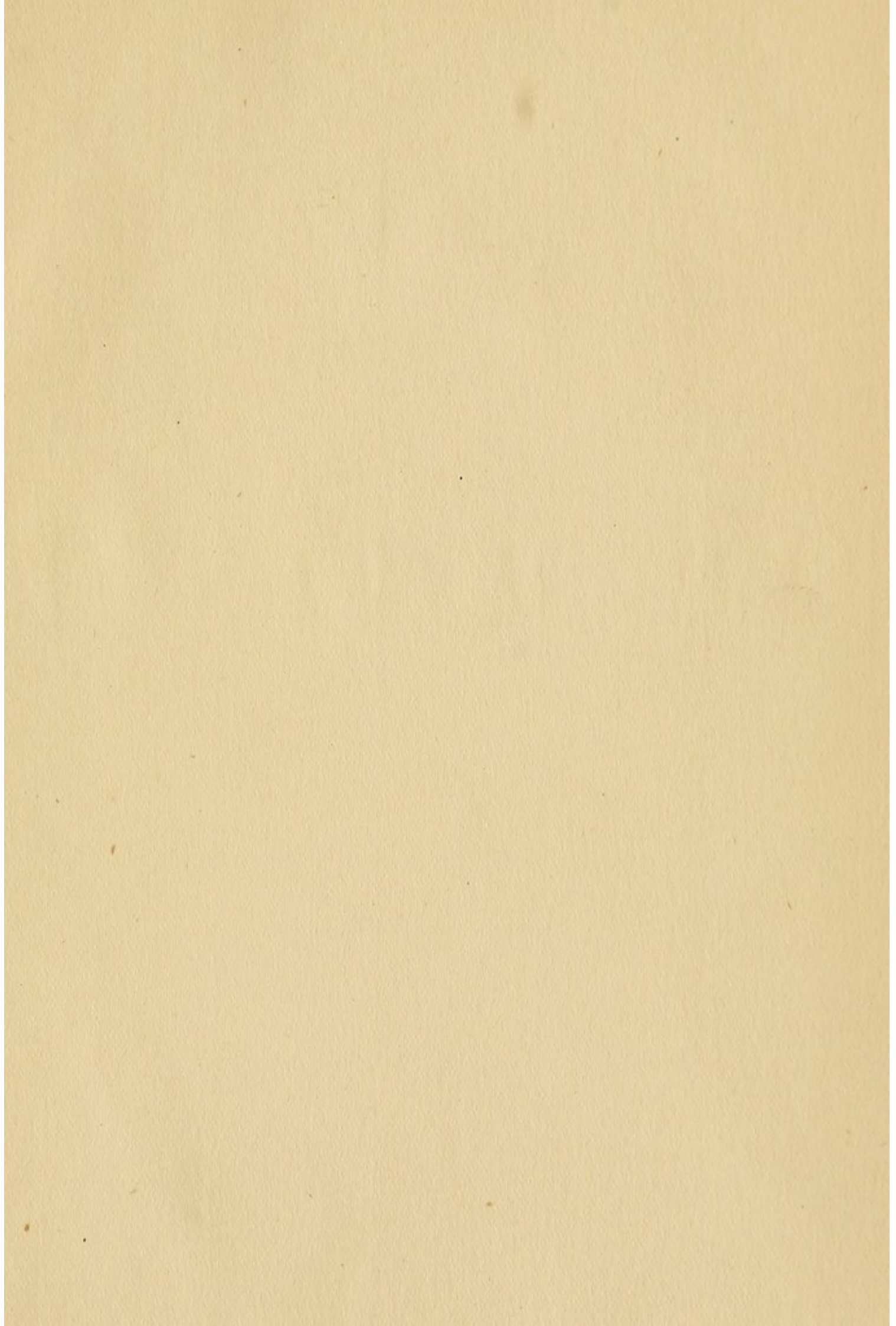
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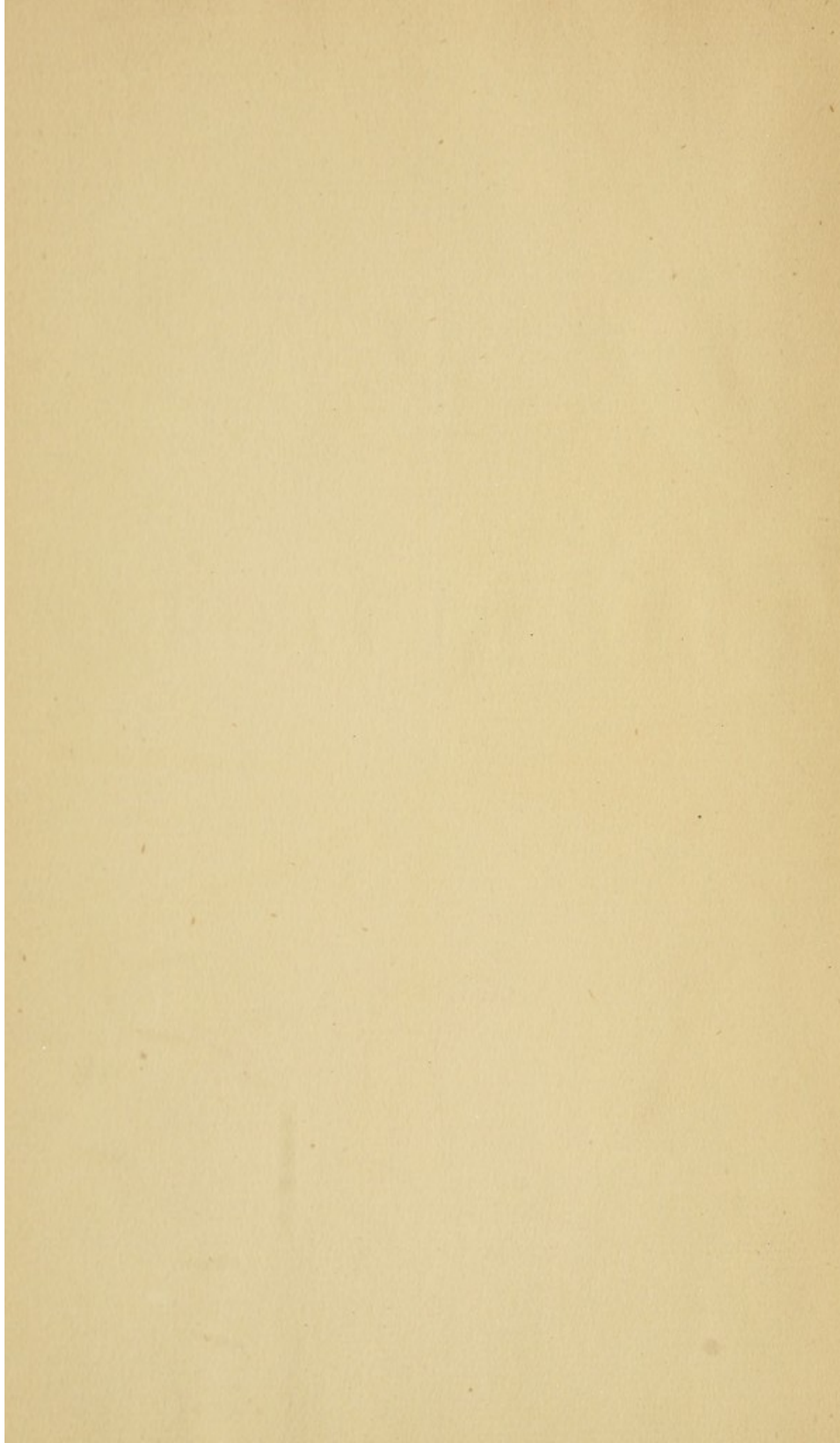


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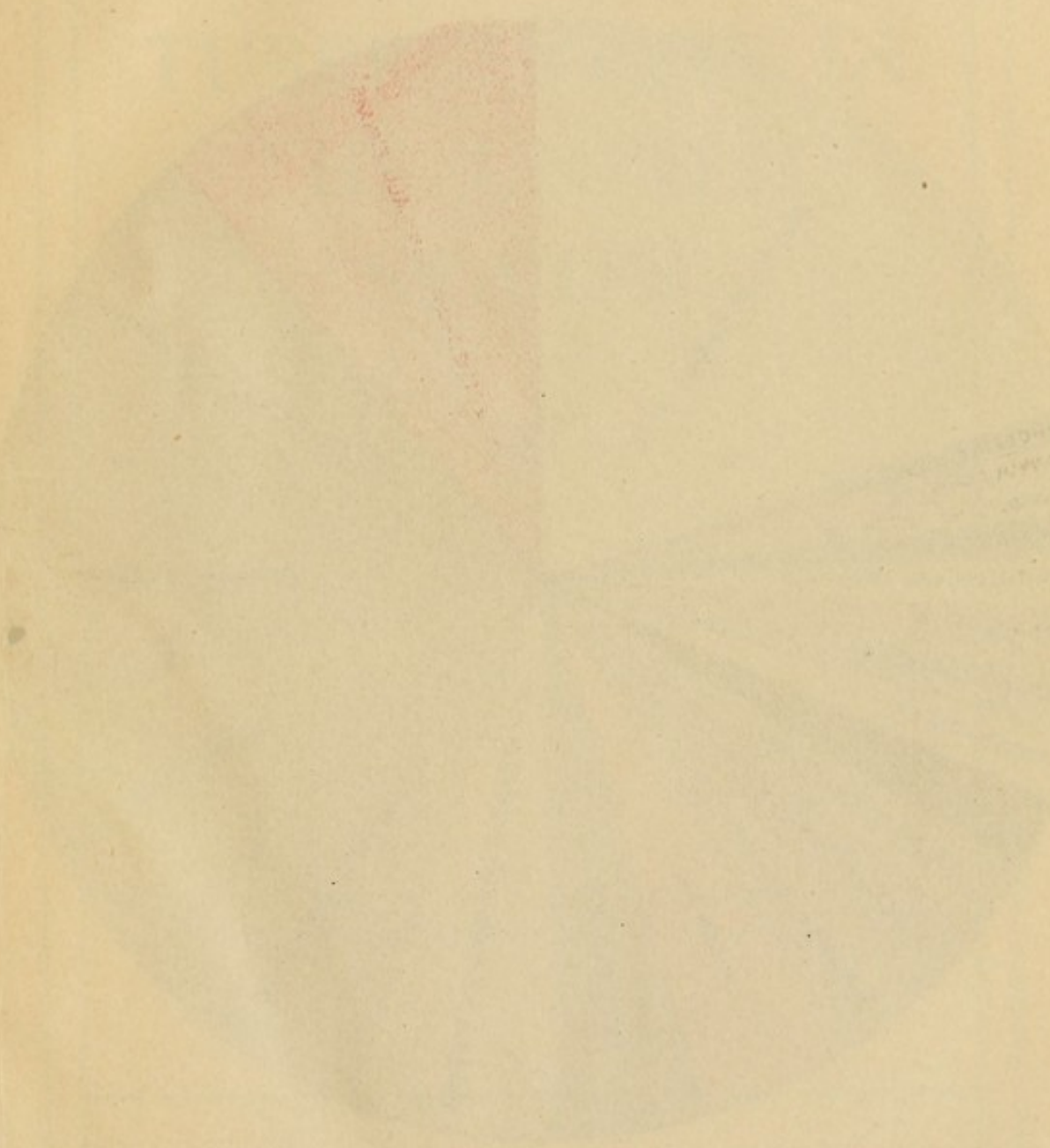




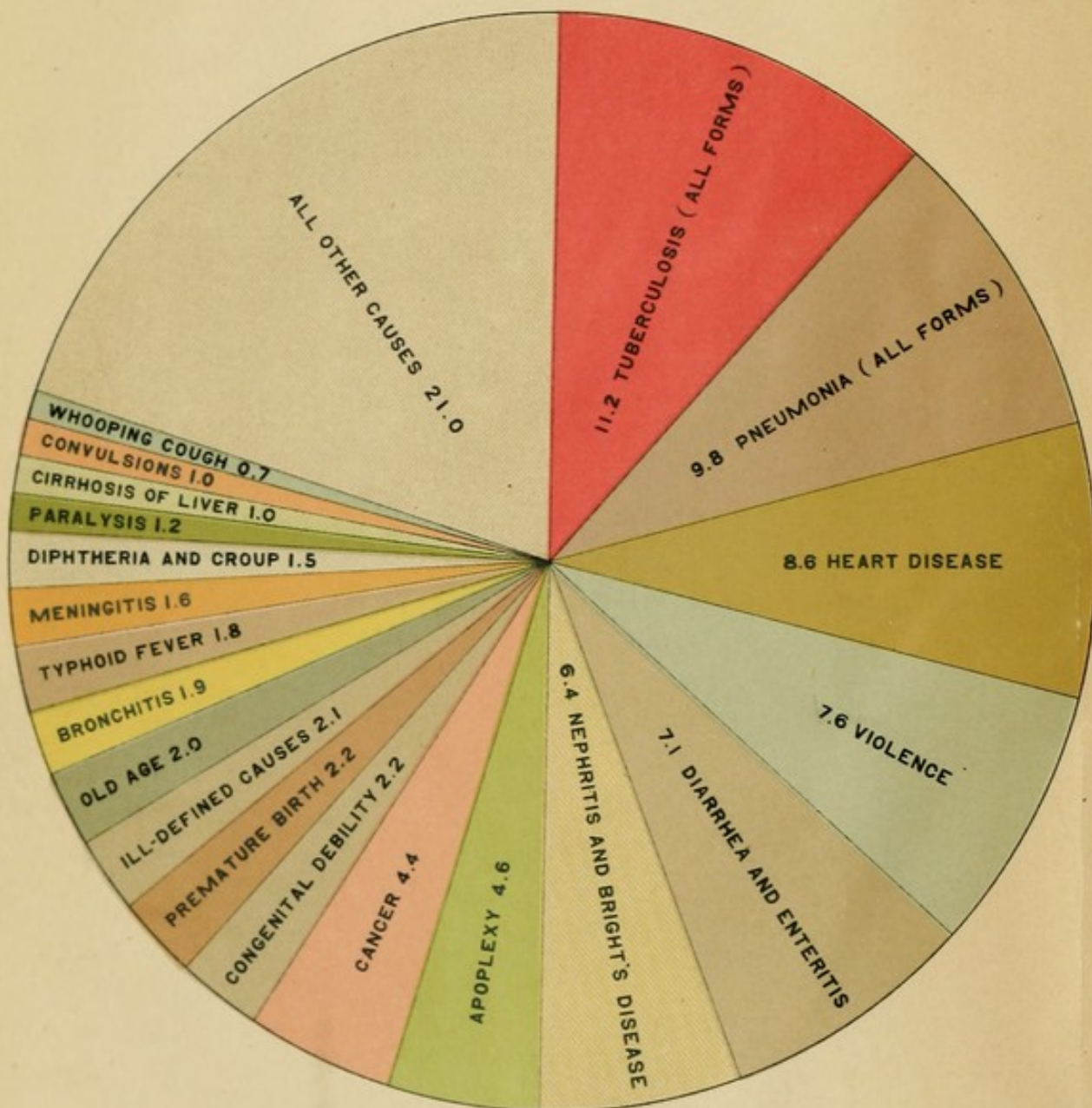
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
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PROPORTION OF DEATHS FROM EACH SPECIFIED CAUSE IN THE REGISTRATION AREA 1907



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TUBERCULOSIS IN
THE UNITED
STATES



PREPARED FOR THE INTERNATIONAL CONGRESS ON TUBER-
CULOSIS, WASHINGTON, SEPTEMBER 21 TO OCTOBER 12, 1908

DEPARTMENT OF COMMERCE AND LABOR

CENSUS PUBLICATIONS ON MORTALITY STATISTICS SINCE 1900.

TWELFTH CENSUS.

Vital Statistics, Part I—Analysis and Ratio Tables.

Vital Statistics, Part II—Statistics of Deaths.

Bulletin No. 15. A discussion of the Vital Statistics of the Twelfth Census.

[The last of the series of decennial reports. The data are for the census year ending May 31, 1900, and are based upon enumerators' returns from the nonregistration area and upon transcripts of deaths from the registration records, chiefly, for the registration area. Succeeding reports are for the calendar years and relate to the registration area only.]

PERMANENT CENSUS.

Mortality Statistics, 1900 to 1904. Five years in one volume.

Mortality Statistics, 1905. Sixth Annual Report.

Mortality Statistics, 1906. Seventh Annual Report.

Mortality Statistics, 1907. Eighth Annual Report. In preparation.

PAMPHLETS.

No. 71. (Circular) Registration of Deaths.

No. 100. Legislative Requirements for Registration of Vital Statistics. [Out of print.
See Nos. 71 and 104.]

No. 101. Practical Registration Methods.

No. 102. Relation of Physicians to Mortality Statistics.

No. 103. Medical Education in Vital Statistics. [Out of print.]

No. 104. Registration of Births and Deaths.

No. 105. Statistical Treatment of Causes of Death.

No. 106. Extension of the Registration Area for Births and Deaths.

No. 107. Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death.

No. 108. Legal Importance of Registration of Births and Deaths.

No. 109. Tuberculosis in the United States.

Manual of International Classification of Causes of Death.

NOTE.—Any publications now in print may be obtained upon application to the Director of the Census.

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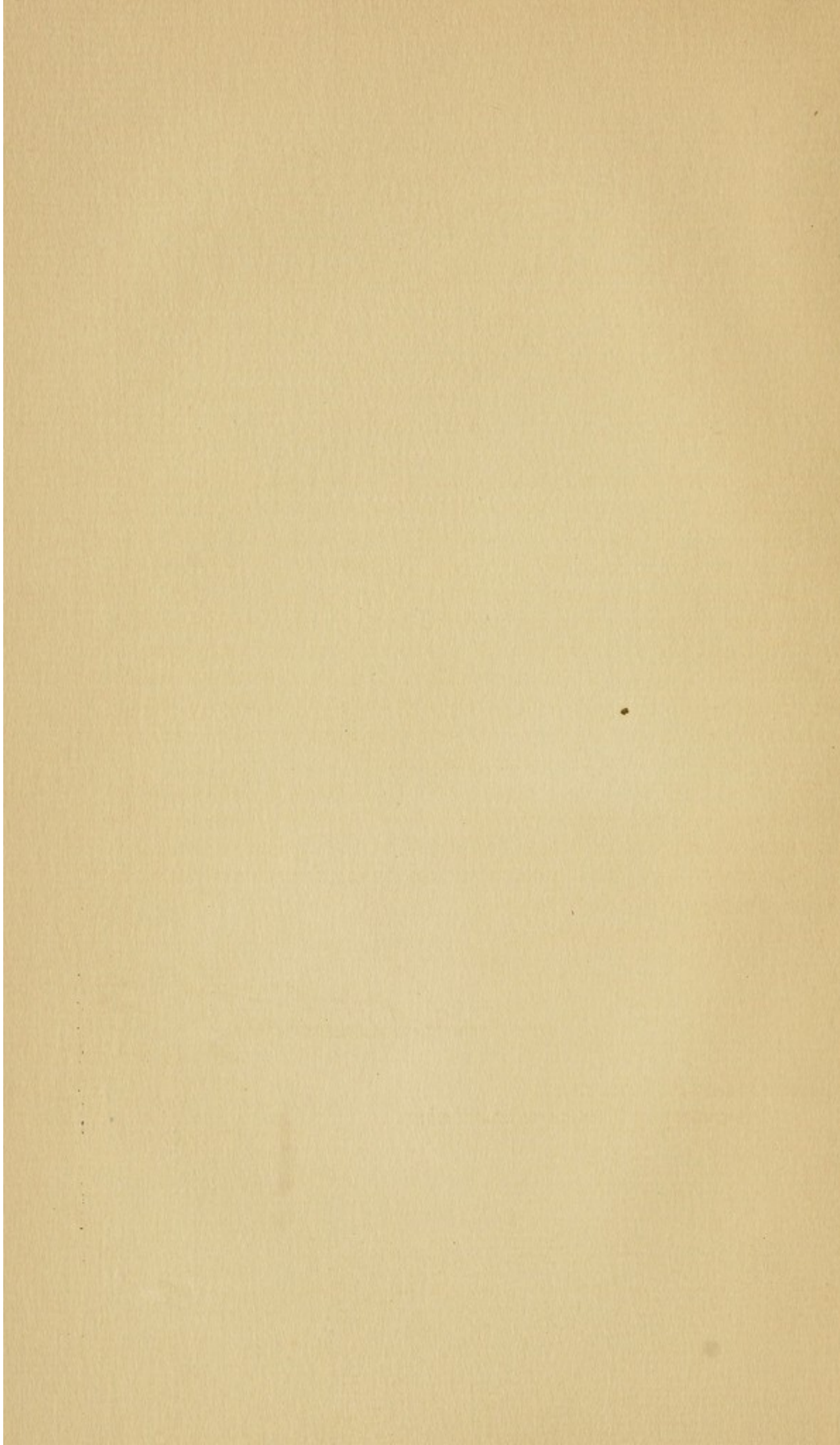
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LETTER OF TRANSMITTAL.

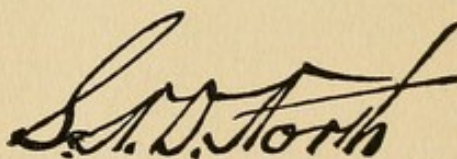
DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF THE CENSUS,
Washington, D. C., July 30, 1908.

SIR:

This pamphlet, the contents of which will form a part of the eighth annual report on mortality statistics for the year 1907, is published in advance of the complete preparation of that report in order that it may be of use to the International Congress on Tuberculosis at its session in this city from September 21 to October 12, 1908. No more important service can be rendered by mortality statistics than the compilation of data which will prove of practical assistance to those actively engaged in the prevention of disease. With the awakening interest of the public in sanitation there is arising an urgent demand, which should be met, that our mortality statistics shall be fully adequate for this important purpose.

This pamphlet has been prepared by Dr. Cressy L. Wilbur, chief statistician for vital statistics of the Bureau of the Census. The diagrams, together with others contained in the Census exhibit, but not reproduced here, were constructed under the direction of Mr. C. S. Sloane, geographer of the Census.

Very respectfully,



Director.

HON. OSCAR S. STRAUS,
Secretary of Commerce and Labor.

(7)

VITAL STATISTICS ARE THE FOUNDATION OF SANITARY
SCIENCE AND ABSOLUTELY NECESSARY FOR THE PREVEN-
TION OF TUBERCULOSIS.

"Our Absurd Vital Statistics.—Vital statistics in this country are an infant science. Yet they are the very basis and foundation of any attempt to better the general health. Knowledge of what is killing us before our time is the first step toward saving our lives. The Census Bureau does its best to acquire this essential information."—*Samuel Hopkins Adams in McClure's, July, 1908.*

"Resolved, That the achievement of the registration of all deaths, with their causes, immediately after their occurrence, and the prompt return of certificates from local registrars to the central bureau of vital statistics, thereby giving the sanitary authorities of the state timely information of the exact prevalence and distribution of disease, IS THE MOST IMPORTANT OF ALL SANITARY MEASURES, AND SHOULD BE UNREMITTINGLY URGED UNTIL SUCCESSFULLY CARRIED OUT IN EVERY STATE OF THE UNION."—*Associated Health Authorities and Sanitarians of Pennsylvania, 1904.*

"Public hygiene is built upon, is controlled and directed by, and is everlastingly in debt to vital statistics. The might and the right to direct the future of preventive medicine, to make and to terminate contracts, to approve and reject risks, to test materials and methods, to invest means and to distribute profits, these things belong inalienably to vital statistics. Every wheel that turns in the service of public health must be belted to this shaft, otherwise preventive medicine must remain invertebrate and unable to realize the profits available from the magnificent offering of collateral sciences. If the unborn historian of hygiene in the twentieth century shall find one anomaly more curious than any other, it will be that the twentieth century, opening with prodigious resources, immediately available, ran a third or half its course before these resources became so standardized that each unit of power might be accounted for in a definite scheme of vital statistics."—*Dr. John S. Fulton, then Secretary of the State Board of Health of Maryland, now Secretary-General of the International Congress on Tuberculosis, in an address, "Vital Statistics: A Plea for Actuarial Administration and Control of the Great Resources of Preventive Medicine," before the American Public Health Association, 1902.*

THE INTERNATIONAL CONGRESS ON TUBERCULOSIS.

LETTER FROM PRESIDENT ROOSEVELT.

THE WHITE HOUSE, *Washington, May 12, 1908.*

TO DR. LAWRENCE F. FLICK,

Chairman, Committee on International Congress on Tuberculosis:

SIR: It is with great pleasure that I accept the presidency of the "International Congress on Tuberculosis" which is to meet in this city on September 21, 1908, and extend its session to October 12, 1908. Official duties, however, may prevent my presiding at the initial meeting of the Congress, in which case I will deputize Secretary Cortelyou.

The importance of the crusade against tuberculosis, in the interest of which this Congress convenes, can not be overestimated when it is realized that tuberculosis costs our country two hundred thousand lives a year, and the entire world a million lives a year, besides constituting a most serious handicap to material progress, prosperity, and happiness, and being an enormous expense to society, most often in those walks of life where the burden is least bearable.

Science has demonstrated that this disease can be stamped out, but the rapidity and completeness with which this can be accomplished depend upon the promptness with which the new doctrines about tuberculosis can be inculcated into the minds of the people and engrafted upon our customs, habits, and laws. The presence in our midst of representatives of world-wide workers in this magnificent cause gives an unusual opportunity for accelerating the educational part of the program.

The modern crusade against tuberculosis brings hope and bright prospects of recovery to hundreds and thousands of victims of the disease, who under old teachings were abandoned to despair. The work of this Congress will bring the results of the latest studies and investigations before the profession at large, and place in the hands of our physicians all of the newest and most approved methods of treating the disease—a knowledge which will add many years of valuable life to our people and will thereby increase our public wealth and happiness.

The International Congress on Tuberculosis is in the interest of universal peace. By joining in such a warfare against a common foe the peoples of the world are brought closer together and made to better realize the brotherhood of man; for a united interest against a common foe fosters universal friendship. Our country, which is honored this year as the host of other nations in this great gathering of leaders and experts, and as the custodian of the magnificent exhibit which will be set up by the entire world, should manifest its appreciation by giving the Congress a setting worthy of the cause, of our guests, and of ourselves. We should endeavor to make it the greatest and the most fruitful Congress which has yet been held, and I assure you of my interest and services to that end.

With expressions of appreciation for the compliment conferred in extending the invitation to become president of the Congress,

Very respectfully,

THEODORE ROOSEVELT.

TUBERCULOSIS IN THE UNITED STATES.

INTRODUCTORY.

The Census of the United States was primarily constituted for the purpose of making a decennial enumeration of population so that the representation of the various states in the lower house of Congress might be apportioned properly. The First Census was taken in 1790, and a decennial census has been taken every tenth year since that time; the last, for the year 1900, was the Twelfth Census, and the next one, the Thirteenth Census, for which plans are already being made, will be for the year 1910.

Purpose of the Census.

A correct enumeration of population, at sufficiently frequent intervals, is absolutely essential to the proper presentation of vital statistics, and hence the constitutional provision that the people should be counted every ten years may be considered to have laid a part of the foundation of vital statistics, and therefore of modern preventive medicine, in the United States.

Vital statistics dependent upon enumeration of population.

It was not enough, however, merely to enumerate the population at regular intervals, but at an early date the importance of vital statistics to the people of the United States was realized, and an effort was made to secure such statistics in connection with the other Census inquiries. England began a comprehensive series of "Annual Reports of the Registrar-General of Births, Deaths, and Marriages" in 1837, from which period dates the beginning of modern sanitation. Other European countries soon followed her example, until, at the present time, there is scarcely a civilized nation upon the globe—except the United States of America—but possesses a complete official registry of the vital events of its people. The movement was felt in the United States. The "First Annual Report of the Secretary of the Commonwealth to the Legislature: Under the Act of March, 1842, relating to the Registry and Returns of Births, Marriages, and Deaths in Massachusetts" was published in 1843, and the annual volumes have been continued regularly down to the present time. Every citizen of the United States, as well as every citizen of Massachusetts, should take interest and pride in these reports, for they are nearly all that we have in the way of a continuous history of

The beginning of vital statistics.

the movement of population and the variations in the vital statistics of any considerable portion of the American people for the last half of the nineteenth century.

Success and failure of state registration laws.

Other states attempted to follow the example of Massachusetts, as summarized in the tenth annual report of that state:

As observed above, the law in this state was passed in 1842. This law was modified and improved by the act of March 16, 1844, and still further by the act of May 2, 1849. The state of New York followed with a registration law, passed, April 28, 1847, and made their first report in April, 1848. New Jersey passed a law on the subject March, 1848, and remodeled it with improvements by the act of March 19, 1851. Their report before us bears date of February, 1852. The registration law of Connecticut passed, June 24, 1848. We have their three reports; the last is dated May, 1852. New Hampshire passed a less efficient law, July 7, 1849, and altered it without much improvement, July 4, 1851. The act in Pennsylvania on this subject passed the legislature of that state, April 14, 1851, and became a law without the signature of the governor, as certified by the proper authorities, January 12, 1852. During the last session of the legislature that body manifested their approbation of it by appropriating \$4,500 to put the law into operation. On the 9th of January, 1852, the legislature of Kentucky passed a registration law, and the subject will come from influential sources before the next legislature of South Carolina.

This was the somewhat hopeful condition of the movement for registration of vital statistics in the United States over half a century ago, but the results were not commensurate with the expectations entertained at that time. The original New York law was a total failure, and no other effort was made in that state until nearly forty years later when the excellent system planned by Dr. Elisha Harris went into effect. Massachusetts and New Jersey were the only states of the original "registration area" as constituted for the mortality statistics of the Tenth Census, 1880. All of the New England states are now included, the last to be admitted being Maine, whose law dates from 1891. The early Pennsylvania law was a dead letter, and later attempts at registration were futile until the enactment of the excellent law of 1905, whose results justified the admission of the state to the registration area in 1906. During the session of 1908 the legislature of Kentucky failed to act upon a registration bill, and no effective law for this purpose yet exists in any Southern state.

The net results of the unassisted efforts of the states to secure the adoption and enforcement of adequate registration laws may be seen in the list of those accepted for the registration area of the Twelfth Census, 1900, as having at least fairly complete (90 per cent) registration of deaths:

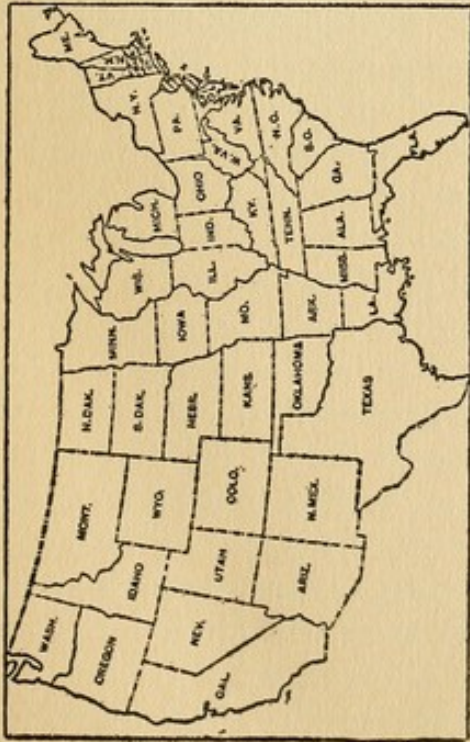
Present constitution of registration area for deaths.

Connecticut.
Maine.
Massachusetts.
Michigan.
New Hampshire.

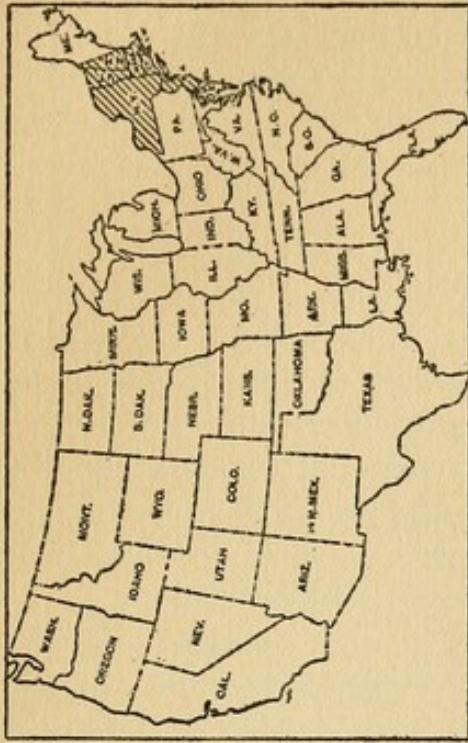
New Jersey.
New York.
Rhode Island.
Vermont.

INCREASE IN THE NUMBER OF REGISTRATION STATES

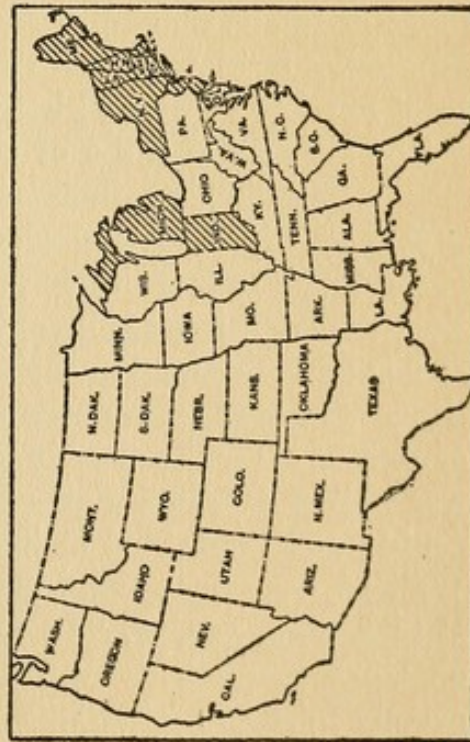
1880



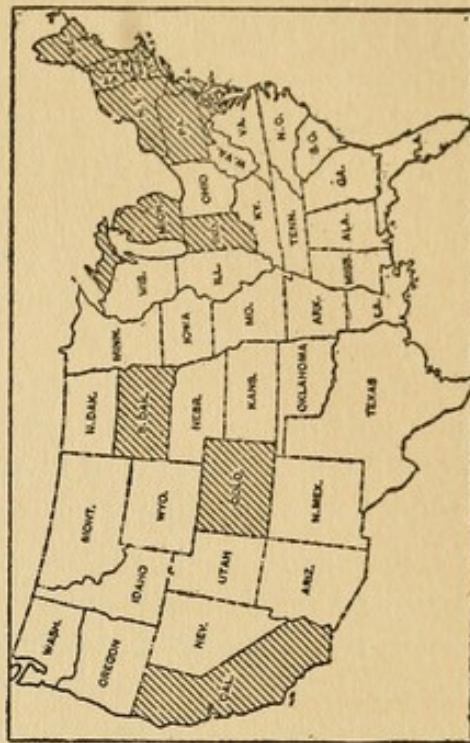
1890



1900



1907



To this limited list Indiana was added in the year 1900, and in 1906 the states of California, Colorado, Maryland, Pennsylvania, and South Dakota were accepted, so that at present there are fifteen of the forty-six states of the Union included therein. The District of Columbia, which is coterminous with the city of Washington, is regarded as a registration city rather than as a registration state, and with 76 other registration cities in nonregistration states helps to raise the total population of the registration area, according to the estimate for 1907, to 41,758,037, or 48.8 per cent of the total population of the United States.

The above statements relate to the registration of deaths. There is as yet no registration area for births, because it is not yet known that any state in this country has succeeded in registering even 90 per cent of the births that actually occur within its limits. The reasons for this are stated in the Census Report on Mortality Statistics, 1906 (page 16), and also in the pamphlet on the "Legal Importance of Registration of Births and Deaths," copies of which will be distributed at the International Congress on Tuberculosis in connection with the present publication. It should be remembered that on account of the entire absence of effective registration of births in this country, valuable data that would be of service to the Congress and to all who are concerned in the prevention of tuberculosis and other diseases are entirely wanting. It is impossible to present any statement of infant mortality from tuberculosis, some forms of which are especially fatal to infants and young children, because there is no total number of living births upon which to base the ratio.

The success of some of the systems of state registration and the increasing realization of the importance of a knowledge of mortality statistics with respect to their practical sanitary uses led to the incorporation of this subject as one of the inquiries of the Seventh Census (1850). It has been retained in each of the decennial enumerations since that time. The method adopted was unfortunate, namely, the enumeration of deaths after the close of the year by the Census enumerators. It was well understood by the Census authorities that satisfactory results could not be obtained by such means. As stated by Gen. Francis A. Walker, Superintendent of the Tenth Census, 1880 (Compendium, Part I, page xxxiii), "In truth, however, the statistics of mortality obtained through the census have always been defective, and often grossly misleading." This was to be expected, because the ordinary census method of *enumeration*, which is properly used for population which can be counted at a given time, is totally inapplicable to the collection of data concerning vital events, such as births, deaths, and marriages. If accurate statistics are to be obtained, these events

No registration area for births.

Attempted national mortality statistics.

must be *registered* immediately after their occurrence, and under laws which provide penalties for neglect.

The true mortality statistics of the United States began with the establishment of the "registration area," at first consisting only of two states and twenty cities, in 1880. It has progressed so far that we are quite justified in recommending that the futile attempt at a decennial enumeration of deaths be discontinued, and that sole dependence be placed upon the results of immediate registration of deaths under proper state laws effectively enforced. A very important part of the duty of the Bureau of the Census since its permanent organization in 1902—such work was quite out of the question under the old system whereby the Census Office was completely disorganized or nonexistent during the interdecennial years—is extension work; that is, cooperation with the sanitary authorities of nonregistration states, and with such great national organizations as the American Medical Association, the American Public Health Association, and the Conference of Commissioners on Uniform State Laws, for the purpose of securing adequate registration laws. A model bill for this purpose, indorsed by the national associations and by the Bureau of the Census, will be presented to the legislatures of nonregistration states at their next sessions. In addition to the new registration states added in 1906, several other states, namely, Minnesota, Montana, Nebraska, North Dakota, Ohio, Utah, Washington, and Wisconsin, have recently adopted laws whose results are now under observation.

How the Census aids in this work may be learned from some of the pamphlets found in the list of publications (page 2). The more rapid its progress the sooner will come the time when Americans will possess vital statistics which cover the entire country, and of which they need no longer be ashamed in comparison with those of other nations. For no amount of devoted work on the part of those immediately in charge of the subject of mortality statistics in the Census—and the names of Dr. Edward Jarvis, Dr. John S. Billings, and Mr. William A. King are honored among the vital-statisticians of the world—can make up for the absence of materials for their labors. So long as present conditions continue the United States must stand in the eyes of the world as practically a nonregistration country—a country having only partial registration. The Census can do nothing directly to remedy this; the registration of births and deaths is entirely dependent upon state and city laws. When the people, who are affected by the failure or absence of such laws, shall come to see their importance, there will be a rapid extension of effective registration, and the United States will no longer be compelled to confess failure in one of the requisites of modern government, the proper registration of vital statistics.

Extension of the registration area.

How the Census aids.

I.—SOME FACTS IN REGARD TO TUBERCULOSIS IN THE UNITED STATES
FROM THE MORTALITY STATISTICS OF THE CENSUS.

Incomplete as they are, the mortality statistics of the Census form the only source of information in regard to the actual prevalence of tuberculosis and other diseases in the United States or any considerable portion of it, apart from the data presented for individual states and cities in their annual registration reports. These reports vary greatly in their quality, and present such marked differences in the methods of compilation that it is extremely difficult for any person except a statistical expert to prepare comparable tables from them. For a general examination of the occurrence of tuberculosis, even as restricted to the states of the registration area, it is therefore necessary to resort to the compilations made by the Bureau of the Census, which present the data with absolute uniformity so far as method of compilation is concerned, and with all of the accuracy that is obtainable from the original returns.

Mortality statistics of the Census indispensable.

The tables themselves, for the most part, will be presented at the end of the pamphlet, where they may be referred to conveniently in connection with the present brief text, which is intended only to point out some salient features. Their sources are chiefly the two volumes on Vital Statistics of the Twelfth Census, 1900, which present comparative figures for the census years ending in 1900 and 1890, and the last published volume of the series of annual reports, which began with the calendar year 1900. The tables in the latter (Mortality Statistics, 1906) give comparative rates for several recent years (1902 to 1905) and a quinquennial average (1901 to 1905) for the purpose of convenient reference. It is not worth while, as a rule, to make any comparison with the rates for the registration area of the Tenth Census, 1880, because this area was so small and so largely urban in character that it can not be taken as fairly comparable with the registration areas of 1890, 1900, and later years.

Sources of tables.

Statistics for 1907 from the annual report which is now in preparation and will be published very shortly, have been introduced in many of the tables. It should be remembered that the present text and the illustrative diagrams were necessarily prepared some time before the meeting of the International Congress on Tuberculosis, and hence it was necessary to use the data at hand at that time, the latest published being those contained in the annual report for 1906. Tuberculosis does not as a rule show marked fluctuations from year to year, and hence the statistics for the year 1906 may be taken equally with those for 1907 as representing present conditions.

Statistics for 1907.

The first question that naturally presents itself is, *What is tuberculosis?* The word "tuberculosis" is of comparatively recent vogue in vital statistics and in general medical and popular usage. ^{The nature of tuberculosis.} As recently as the Twelfth Census, 1900, the official term employed in the mortality statistics for tuberculosis of the lungs was "consumption." In the earlier statistics "consumption," or "phthisis," was regarded as a local disease of the lungs, and other forms of tuberculosis were elsewhere classified in connection with the organs or parts of the body affected. The present conception of tuberculosis is that of a general infectious disease, capable of affecting all parts of the human body, but, in whatever situation found, caused by the *Bacillus tuberculosis*, the "germ" which was discovered by Robert Koch in 1882. It is a general disease, because it may affect the entire organism; and it is an infectious, or infective, disease, because it may be communicated, either directly or indirectly, from a person ill with it to a healthy person, by means of the bacillus that causes it. But it is *not* a contagious disease, in the sense that smallpox and scarlet fever are actively contagious or transmissible by mere contact; and it is a cruel injustice to tuberculous persons who take proper precautions in regard to the destruction or disinfection of their sputa, to treat them with the abhorrence that is usually associated with leprosy and smallpox.

The present tendency in mortality statistics is to deal with the total number of deaths from tuberculosis, so far as obtainable, and it is therefore necessary in ^{Tuberculosis (all forms).} employing the older statistical tables to consolidate the deaths compiled under the various forms formerly in use, such as "consumption" (tuberculosis of lungs), "scrofula and tabes" (tuberculosis of lymphatic glands and abdominal tuberculosis¹), and "hydrocephalus" (tuberculous meningitis), in order to obtain the number of deaths from *tuberculosis (all forms)*, which is stated whenever possible. The International Classification of Causes of Death, which was adopted by the Census beginning with the statistics for the calendar year 1900, brings many of the forms of tuberculosis together, but even yet does not include "scrofula;" the number of deaths thus returned, however, is insignificant; and the title will probably be abolished at the decennial revision which occurs next year.

The next question that would naturally occur to a person interested in the prevention of tuberculosis in this country is, *What is the mortality—the total number of deaths and the death rate—from tuberculosis in the United States?* ^{Mortality in the United States from tuberculosis.} This knowledge is very needful, because it

¹ Title No. 29, *Tuberculose abdominale*, of the International Classification; itself an objectionable term, for which tuberculous peritonitis could perhaps preferably be substituted.

would inform us of the importance of the disease at the present time and enable us to know, by means of future comparisons, whether the restrictive work inaugurated by the International Congress on Tuberculosis is bearing practical fruit in lives saved from this disease.

It is necessary to confess frankly that an exact answer can not be given to this question. Neither the total number of deaths in the United States from tuberculosis (or any other disease) can be stated for any year, nor can the death rate, which is dependent upon an exact registry of all deaths from this cause, be given. Until the United States shall possess an effective system of registration of vital statistics such absolutely necessary data can not be obtained.

In the absence of facts, and only in the absence of facts, estimates may be permissible. In his letter accepting the presidency of the International Congress on Tuberculosis the President of the United States has referred to the loss of *two hundred thousand lives a year* in our country from this cause. The statement is a reasonable one and probably well within the limits of precision attaching to any estimate. For the year 1907 there were registered and returned to the Bureau of the Census from the states and cities of the registration area, having an estimated population of 41,758,037, or 48.8 per cent of the total population of continental United States, 76,650 deaths from the various forms of tuberculosis recognized by the International Classification. If it is assumed that the death rate from tuberculosis for that part of the country not covered by registration returns was equal to that ascertained for the registration area, then the number of deaths that occurred in the entire United States in 1907 would be about double the number reported, or approximately 153,000. But it is reasonable to suppose that the death rate from tuberculosis for the nonregistration area may have been higher than that for the registration area. The map¹ showing the relative proportion of deaths from consumption during the census year 1900 in different state groups per 1,000 deaths from known causes does not present a maximum mortality, as indicated by the heaviest coloring employed, for any portion of the present registration area except California, western and central South Dakota (very sparse population and high Indian tuberculosis rate), eastern Colorado, and the Ohio River belt of counties in Indiana. For the nonregistration area, on the other hand, we find maximum relative prevalence of tuberculosis in Nevada, Arizona, northern Missouri, the Gulf counties of Alabama and Mississippi, the central counties of North Carolina and South Carolina, and all of the states of Kentucky, Tennessee, Virginia, and West Virginia. Moreover the mortality of the colored population is much

No exact statement possible.

The President's estimate.

¹ Vital Statistics, Twelfth Census, Plate No. 18.

higher than that of the white population from this disease, as indicated by Table 9 (page 60), and also by the subjoined table from Mortality Statistics, 1907:

AREA.	NUMBER OF DEATHS FROM TUBERCULOSIS OF LUNGS PER 100,000 OF POPULATION: 1907.	
	White.	Colored.
Maryland, rural.....	106.5	230.2
Washington, D. C.....	153.6	448.0
Louisville, Ky.....	161.0	328.1
New Orleans, La.....	231.6	498.0
Baltimore, Md.....	182.2	498.2
Kansas City, Mo.....	129.3	679.8
Memphis, Tenn.....	118.3	249.7

The rates given above indicate that the negro death rate from tuberculosis of the lungs is markedly higher than the white death rate, not only in cities but also in rural districts, of which Maryland affords the only example. It is probable, moreover, that the registration of deaths is somewhat incomplete in rural Maryland; it is known to be practically worthless in certain counties of that state, while in all of them the registration of the deaths of negroes is probably not so thorough as the registration of the deaths of white persons. Hence a higher mortality from pulmonary tuberculosis may fairly be assumed for all of the negro population than that for the corresponding white population. There were in the registration area as constituted in the census year 1900 only 1,180,546 negroes, or 4.1 per cent of the total population. Subtracting these from the 8,833,994 negroes in continental United States in 1900, we have 7,653,448 negroes in the non-registration area in 1900. No notable addition of negro population has been made to the registration area since that date, except Maryland exclusive of Baltimore, Annapolis, and Frederick, representing a net increase of 131,862 negro population as enumerated in 1900. The death rate of the total white and colored population of the registration area from tuberculosis of the lungs was 158.9 per 100,000 for the year 1907. If we subtract this rate from the rate shown for the colored inhabitants of the rural part of Maryland (230.2 per 100,000), and apply the difference (71.3 per 100,000) to the negroes of the nonregistration area enumerated in 1900, we shall find a probable increase of about 5,500 deaths a year from pulmonary tuberculosis alone. Considering the imperfect registration of deaths in rural Maryland, the additional deaths from other forms of tuberculosis, and the increase of the negro population since 1900, perhaps from 10,000 to 15,000 more deaths of colored persons from all forms of tuberculosis would

be added to the returns on account of the greater relative negro mortality from tuberculosis if we had effective registration in the South. This is in addition to the number corresponding to the average death rate (white and colored) of the registration area (183.6 per 100,000).

The chief objection that can be urged against the view that the number of deaths from tuberculosis in the non-registration area considerably exceeds that of the registration area is that the former contains much sparsely settled territory, and that it is well known that the mortality from tuberculosis increases with the crowding together of people. On the other hand, the inhabitants of sparsely settled regions form a comparatively small aggregate of population, and in many localities of this class, as in Arizona, New Mexico, Florida, and Texas, there is a considerable influx from other states of invalids suffering from tuberculosis, whose deaths, when they occur, are not charged to the states in which the disease originated.

Finally, there is a large margin of possible error and probably of understatement in the recorded deaths from tuberculosis even in the registration area. How many deaths from pulmonary tuberculosis have been reported as due to "heart failure," "congestion of lungs," "debility," "inanition," "marasmus," and the like? Many deaths from "chronic bronchitis" and "bronchopneumonia" are really due to tuberculous infection. A majority of the cases of acute serofibrinous pleurisy are tuberculous (Osler), and many of the deaths reported from "hemorrhage"—practically all of those from "hemorrhage of the lungs"—are those of tuberculous persons. Reports of deaths from "lung trouble," "heart disease," and in fact any form of disease, may, either through ignorance or intention, conceal deaths from tuberculosis. At least the proportional number (11.2 per cent) of deaths from tuberculosis to deaths from all *known* causes would also apply to the ill-defined or unspecified causes. Dr. J. W. Irwin, physician to the Henry Phipps Institute¹ of Philadelphia, gives a long list of causes of death registered in Philadelphia that he considers to be "probably tuberculosis." Among these are: Abscess of chest, hip, lungs; iliac, lumbar, pleural, and psoas abscess; asthma; congestion of brain, chest, lungs; debility; disease of brain, chest, hip, lungs; dropsy of brain, chest, lungs; empyema; brain fever; inflammation of brain, hip, larynx; marasmus; tabes mesenterica, etc. Among the "possibly tuberculosis" are: Cachexia; cerebro-spinal meningitis; cholera infantum; convulsions; cyanosis; diarrhea; diseases of spine; typhoid fever [a certain proportion]; inflammation of bronchi, chest,

¹ First annual report, page 89.

lungs, peritoneum, pleura, spine, stomach, and bowels; influenza; teething; whooping cough.

Does the list seem extreme? Is it possible that physicians legally authorized to practice medicine will make such returns in cases of actual death from tuberculosis, and that the registration officials will gravely accept such certificates and compile them as official statistics? In regard to the latter point, most registration offices are compelled to accept what they can get; the attending physician is the sole arbiter as to what shall be said or not be said upon the certificate of death. And the absence of any standard nomenclature of diseases in this country renders it difficult for even the careful and intelligent physician to know how to report the cause of death in many cases. Add to this the protean forms of tuberculosis, the difficulty of its diagnosis in some cases, the unwillingness of the attending physician to sign the certificate of death of a patient whose *illness* from this disease he may have failed to report as required by law, and perhaps the fact that the occurrence of the death from this cause may be thought undesirable as a matter of record by the friends or relatives, or may, perchance, conflict with representations made in applications for policies of insurance—there are reasons enough why many deaths from tuberculosis should not be reported and hence not be compiled under this cause. Every registrar is familiar with such cases. A careful and fairly conservative estimate worked out along this line on the basis of the total number of deaths registered in the registration area and enumerated in the nonregistration area during the last decennial census year—with allowance for increase of population and incomplete total number of deaths—showed that about 190,000 deaths might fairly be considered to have occurred in the United States during the year 1907 from tuberculosis or from causes that might be considered, in the proportion assigned, as “probably tuberculosis.”

DISCUSSION OF TABLES.

Only the most important general indications relating to the incidence of tuberculosis are shown in the brief series of tables presented. For more detailed data, and especially for statistics relating to individual localities, reference should be made to the original reports, which are, chiefly, the Vital Statistics of the Twelfth Census, 1900, and the annual reports on Mortality Statistics, 1900 to 1904 (published in one volume), 1905, and 1906. Mortality Statistics, 1907, is in preparation and will be issued soon after the close of the Congress.

Difficulty of securing correct statements of deaths from tuberculosis.

Reference tables beginning on page 49.

Tuberculosis has been more or less steadily decreasing both in its absolute and in its relative importance as a cause of death for many years. The death rates per 100,000 of population from all forms of tuberculosis declined, as follows, in the registration area of the United States from 1880 to 1907:

YEAR.	Death rate.	Per cent of decrease.
1880 (census year)	326.2	.....
1890 (census year)	267.4	18.0
1900 (calendar year)	201.2	24.8
1907 (calendar year)	183.6	8.7

The registration area of 1880 represented only a comparatively small portion of continental United States and was largely urban, so that the decrease from 1880 to 1890 may be partly due to the addition of rural population in the registration states admitted in 1890. Moreover, comparisons in which single years are concerned are not so satisfactory as those based upon a series of consecutive years, as in the following table, showing the decrease in the death rates from all forms of tuberculosis in Massachusetts and in England and Wales:

DECADE.	MASSACHUSETTS.		ENGLAND AND WALES.	
	Death rate per 100,000 of population.	Per cent of decrease from preceding decade.	Death rate per 100,000 of population.	Per cent of decrease from preceding decade.
1851-1860	469.9	.....	348.7	.....
1861-1870	410.9	12.6	327.0	6.2
1871-1880	391.5	4.7	287.8	12.0
1881-1890	364.3	6.9	242.9	15.6
1891-1900	283.2	22.3	200.9	17.3
1901-1906 ¹	218.3	22.9	172.2	14.3

¹ Six-year period.

The decline has been especially marked in Massachusetts during the past six years, the per cent of decrease of the six years 1901-1906 from the decade 1891-1900 (22.9) already exceeding that shown from 1881-1890 to 1891-1900 (22.3). The decline in the English death rate from tuberculosis has been remarkably uniform. Concerning this Doctor Tatham remarks that "there has been an almost steady and not a slow decline in the aggregate mortality from tuberculosis, the rate in the last year being less than half that in the earlier years, and, further, that the decline has been greater in females than in

Overstatement of tuberculosis in early statistics.

Table 1, page 49.

males," although he is careful to note, and the fact should be taken into consideration in comparing all extended series of death rates from this disease, that "with respect to the aggregate mortality from all forms of tuberculosis, although, as previously mentioned, the earlier records hardly warrant a definite conclusion, it is at least probable that in the fifties and sixties of last century mortality was to some extent overstated." About that time in Massachusetts Hon. John G. Palfrey, secretary of state, declared in the third annual registration report for the year ending May 1, 1844, that "*consumption* is the grand receptacle for all lingering diseases, of whatever nature, which prove fatal." It is probable that the present tendency is to understatement, rather than to overstatement, in the returns of deaths from the various forms of tuberculosis.

"Proportional deaths" showing the ratio from tuberculosis per 1,000 deaths from all causes have some degree of usefulness, because they indicate the relative importance of this cause of death as compared with others. They do not show the incidence of mortality upon a fixed and comparable basis, and the figures fluctuate inversely with the excessive prevalence of other disease. It is significant, however, that in Massachusetts, for the period 1851-1860, over a quarter of the deaths at all ages (257.5 per 1,000) were from tuberculosis, while now, 1901-1906, less than one-seventh (131 per 1,000) are from this cause. The registration area gives a proportion of 117.9 per 1,000 for the last six years, which is curiously close to the ratio shown by the returns of the Seventh Census, 1850 (116.6 per 1,000), although no safe deductions can be drawn from the very imperfect older statistics.

In order to appreciate the condition of the United States as compared with other parts of the world with respect to the mortality from tuberculosis, comparison of the death rates from this disease may be made on the basis of the statistics contained in the international tables printed each year by the Registrar-General of England and Wales. Unfortunately all of the countries do not tabulate total deaths from tuberculosis, so that it is necessary to restrict the comparison to tuberculosis of the lungs; and there may be some considerable element of doubt even as regards the deaths thus returned as a result of differences in statistical methods and the customs followed by physicians in the various countries in making the original returns. The paucity of fully comparable data concerning this, the most important of all diseases, shows the crying need for a universal system of nosological classification, and the desirability that the medical profession in all lands be induced to give greater attention to the requirements incident to the proper reporting of causes of death.

"Proportional deaths."

Table 1, page 49.

Need of fully comparable international statistics of causes of death.

The annual average death rate of the United States (169.9 per 100,000 of population) for a short series of recent years (1901 to 1905) as indicated by the returns from the registration area, places this country in a fairly favorable light as compared with others for which data are available. Much higher rates are shown for Austria (334.8) and Servia (279.7), while the rates for Norway (196.4), Switzerland (188.6), and Germany (185.8) slightly exceed the American rate. Italy (114.9), Belgium (118.2), Netherlands (133.4), the United Kingdom (133.8), Japan (146.3), and Spain (147.8) fall below it. The rate for England and Wales in particular is much below (121.5), but Ireland, with an abnormal age distribution of its population, shows a higher rate (215.3). The extremely low mortality of the Australasian states is very remarkable, ranging from 111.6 for Victoria to only 63.3 for Tasmania.

Tuberculosis may seize upon any organ or part of the body. It may remain localized for years, as in a kneejoint, or it may attack the entire organism at once and with the virulence of an acute infectious disease, as in acute miliary tuberculosis. It is not yet settled in statistical practice whether the seat of the initial infection should be reported, if known, or whether the organ upon which the most serious inroads are made should determine the classification of the disease. Probably the latter plan is preferable; it is more important to know the whole number of deaths that resulted from tuberculosis of the lungs than to attempt to separate the comparatively small number supposed to have resulted from primary laryngeal infection. But if the true source of infection could be determined—whether through the food and so on indirectly to the lungs, or directly from the air—it would be a matter of supreme importance. As it is, the mortality statistics measure only the results and the primary causes remain obscure.

Among the multitude of forms of tuberculosis recognized by the Nomenclature of Diseases of the Royal College of Physicians of London are the following: Tuberculosis of adrenals, arteries, bladder, bones, brain, bronchi, conjunctiva, fauces, gums, intestines, kidneys, joints, larynx, liver, lungs, lymphatic glands, middle ear, mouth, nasopharynx, nerves, nose, pancreas, pericardium, peritoneum, pharynx, pleura, skin, spleen, stomach, tongue, and of other organs and parts of the body. It is needless to say that such an extended list would not be practicable for the purposes of a general statistical report, and hence all statistical classifications attempt to reduce the most important forms in which tuberculosis causes death into more condensed lists. For example, in accordance with the International Classification of Causes of Death, the following forms of tuberculosis were

Death rates of foreign countries.

Table 2, page 52.

How tuberculosis kills.

Various forms of tuberculosis.

Table 3, page 52.

compiled for the registration area of the United States for the year 1907:

FORM OF TUBERCULOSIS.	Number of deaths.
Tuberculosis (all forms)	76,650
Tuberculosis of lungs	66,374
Tuberculosis of larynx	690
Tuberculous meningitis	4,062
Abdominal tuberculosis	2,629
Pott's disease	594
Tuberculous abscess	65
White swelling	209
Tuberculosis of other organs	713
General tuberculosis	1,254

Nearly nine-tenths of all of the deaths from tuberculosis are due to tuberculosis of the lungs. Some of the forms given are of very minor importance, and perhaps it might be desirable to give greater detail in regard to the more fatal forms of the disease. Does this mode of presentation of the mortality statistics best answer the purpose of sanitarians and of practical clinicians and does it meet the demand for complete information in regard to all features of this disease that will surely arise from the present concentration of attention upon it through the International Congress on Tuberculosis? If not, immediate steps should be taken to suggest the necessary changes so that they may be incorporated in the second decennial revision of the International Classification which will be held in 1909.

Comparison of statistical classifications.

For the purpose of comparison with the above statement of the methods by which tuberculosis kills, we may submit the corresponding English figures for 1906 according to the classification used by the Registrar-General:

FORM OF TUBERCULOSIS.	Number of deaths.
Tuberculosis (all forms)	56,841
Pulmonary tuberculosis (tuberculous phthisis)	18,384
<i>Phthisis</i> (not otherwise defined) ¹	21,362
Tuberculous meningitis	6,104
Tuberculous peritonitis	3,857
<i>Tabes mesenterica</i> ¹	1,238
Lupus	84
Tubercle of other organs	1,809
General tuberculosis	3,954
<i>Scrofula</i> ¹	49

¹ Terms in italics are regarded as indefinite and unsatisfactory by the Registrar-General.

Sex is apparently an influential factor in determining differences in mortality from tuberculosis. For the states of the registration area during the census year 1900 the death rate of males from tuberculosis of the lungs was 188.4 per 100,000 of male population, while the corresponding death rate of

Influence of sex.
Table 4, page 53.

females was only 163.3. The mortality of males exceeded that of females from this disease by 15.4 per cent. The corresponding rates for 1890 were, for males, 257.7 per 100,000 of male population; for females, 240.4; relative male mortality in excess of female mortality from "consumption," 7.2 per cent. So the disproportionate excess of male mortality from tuberculosis of the lungs more than doubled during the ten years that elapsed from 1890 to 1900. In Massachusetts the male mortality from this disease began to exceed the female mortality about 1894.

A similar change has been in progress in England and Wales. In the earlier years of registration in England the mortality of females from "phthisis" invariably exceeded that of males. About 1856 the curve representing the male death rate rose slightly above the curve for the female rate, and the difference has increased in a fairly regular way from year to year since that time. During the decade 1861 to 1870 the death rate of males was 253.8 and of females 255.2, while in the last decade, 1891 to 1900, the rates were 158.0 and 121.4, respectively.

Certainly such changes are very significant, and perhaps are due, to some extent, to a progressive tendency among women to live more in the open air than formerly. The "athletic girl" is not the sort that "goes into a decline" in the interesting way common to fiction of the first half of the last century, but there must be an additional reason, first, why under the extremely bad hygienic conditions of the old days, when woman was considered a hothouse plant and treated accordingly, female mortality from tuberculosis was not vastly higher, not merely considerably higher, than male mortality; and, second, why under present conditions the female death rate is now so markedly lower, although men are still, on the whole, more commonly engaged in outdoor occupations than women.¹

Crowding into dense city quarters means increased mortality from tuberculosis, although there may be some tendency to report correctly a larger proportion of deaths from tuberculosis in the city than in the country. Following are the death rates from tuberculosis of lungs per 100,000 of urban and of rural population in the registration states during the last two decennial census years and the last year contained in the series of annual reports:

YEAR.	Cities.	Country.
1906 (calendar year).....	181.5	121.9
1900 (census year).....	204.8	134.1
1890 (census year).....	293.5	181.0

¹ Tuberculosis affects nutrition. Women are perhaps more resistant to conditions affecting nutrition than are men. In India, according to Sir J. A. Baines, "women appear to succumb to famine less than the other sex."³

The rural rate in 1906 was only about two-thirds (67.1 per cent) of the urban rate, although the decrease in the urban rate during the period of sixteen years (38.2 per cent) was slightly larger than the decrease in the rural rate (32.7 per cent). States with a large proportion of urban population will tend to have higher death rates from tuberculosis of lungs than those chiefly rural in constitution; thus in 1907 the rates for New York (171.6), New Jersey (170.6), and Rhode Island (163.6) exceeded those for Indiana (140.2), Maine (134.3), and Michigan (88.7). Other factors must be considered, however, in addition to the mere density of population; for instance, the younger age distributions of some urban populations would tend to lower mortalities.

In England in 1906 the urban counties showed a death rate from phthisis of 149.3 per 100,000 of population while the corresponding rate for rural counties was 129.2, the excess of urban mortality being 15.6 per cent.

One of the influences always to be reckoned with in the analysis of mortality statistics is age distribution of the deaths and of the people among whom they occurred. As a result of the difficulties attend-

Death rates at certain age periods.

Table 4, page 53.

ant upon estimating the age distribution of the population during postcensal years comparisons are most conveniently made of the death rates at certain ages during the last two census years, 1900 and 1890. The aggregate death rate at all ages from tuberculosis of the lungs (pulmonary "consumption") in the registration states declined from 249 per 100,000 of population in 1890 to 175.9 in 1900, or 29.4 per cent; for the thirty-year period of life from 15 to 44 years of age, it fell from 324.8 per 100,000 of population at that age period in 1890 to 239.8 in 1900, or 26.2 per cent; for the twenty-year period of life from 45 to 64 years, it fell from 310.2 to 208.4, or 32.8 per cent; and for the older ages, 65 years and over,

Table 5, page 55.

it fell from 360.5 to 246.6, or 31.6 per cent. Roughly speaking, during the ten years from 1890 to 1900 the death rate from "consumption" decreased one-fourth of its amount for young and middle-aged adults up to 44 years of age, and nearly one-third for those of more advanced ages.

The highest rate shown for 1900, by sex, age, and locality, is for males aged 45 to 64 years living in cities (337.2 per 100,000 of population), and the lowest rate is for females of the same age period living in the country (141.6 per 100,000).

The different forms of tuberculosis vary considerably with reference to the periods of life chiefly affected.

Approximately 28 per cent of the deaths from tuberculosis of the lungs occur between the ages of 25 to 34 years; 21 per cent, from 15 to 24 years; and 20 per cent, from 35 to 44 years. Over two-thirds (67.4

Age distribution of deaths from various forms of tuberculosis.

Table 6, page 55.

per cent) of the deaths from tuberculous meningitis are those of children under five years of age.

The value of a human life can not be measured in dollars and cents.

Economic loss from tuberculosis.

The world is forever poorer on account of the untimely death of Robert Louis Stevenson, though richer for the record of his brave fight against the unrelenting foe—tuberculosis—that harried him to the islands of the great “South Sea” he loved, and slew him there. What would have been the value to literature of a few more years of this single life? And how many are now dying from tuberculosis who, were they but permitted a few more years of healthful life, would, by their works of genius, add immensely to the treasures of humanity! Tuberculosis kills men and women chiefly in the most active, most productive period of life, when their work is worth the most to themselves, to their families, and to the world.

While such loss can not be stated in money, for it transcends all symbols of value, we may consider with amazement some of the results that have been obtained by conservative writers in the attempt to find some clue to the economic injury resulting from this single disease. In an article on “The Statistical Laws of Tuberculosis,”¹ Mr. Frederick L. Hoffman, statistician of the Prudential Life Insurance Company, says:

Estimates of pecuniary loss.

Tuberculosis causes annually more than 150,000 deaths in the United States at the average age of thirty-five years. At this age the normal after-lifetime is about thirty-two years, so that the real loss of life covered, measured in time, is represented by 4,800,000 years per annum. If we assume that the net value of a year of human life after age thirty-five is at least \$50, the real loss to the nation resulting from the disease (a large proportion of which is known to be needless) may be estimated at \$240,000,000 per annum. These astounding and almost incomprehensible figures are far from being an exaggeration, but let us assume that only one-half of this mortality is preventable, and we have a net possible saving to the nation of \$120,000,000 per annum. This estimate does not take into account the social, moral, and sentimental value of at least 100,000 lives, which, under different conditions, might reasonably hope to continue for many years. The mortality from tuberculosis is, therefore, a problem compared with which all other social problems of a medical character sink into insignificance, and it is safe to say that the possible prevention of a large portion of the mortality from this disease is justly deserving of the solicitude, the active personal interest, and liberal pecuniary support of all who have the real welfare of the people of this nation at their heart.

Collier's (July 25, 1908), in an editorial under the title “Expressed in Money,” puts it higher: “Now put it into money, this same saving to the race through intelligent observation. Hunter has estimated the average cost of preparing a man for usefulness at \$1,500. * * * If we could master tuberculosis, the saving in money to the United

¹ Maryland Medical Journal, February, 1904.

States would be \$330,000,000 per year. Is it any wonder, then, that the best physicians are heart and soul in the study of prevention?"

In another very valuable paper,¹ from which several paragraphs may be quoted at length, Mr. Hoffman endeavors to establish the approximate measure of social and economic value of life:

Economic value of life.

Life period of industrial activity.—The period of industrial activity of wage-earners generally, but chiefly of men employed in mechanical and manufacturing industries, it may be assumed, should properly commence with the age of fifteen and terminate at sixty-five. This gives fifty years of labor and life, during which, as the result of individual effort, primarily, of course, for self-maintenance and the support of others, some net addition is annually made to the accumulated wealth of the nation. The large variety of employments, which is so characteristic of modern nations, and the increasing subdivision of labor and the development of special ability, precludes more than an approximate estimate of what normally constitutes the economic gain to society during the period of industrial activity of a wage-earner.

Economic and social value of life.—The usual method has been to confuse cause and effect and to estimate the present value of a workman's life merely upon the basis of his future earnings after deducting the cost of future maintenance. This method, however, does not establish the economic value of men to society, but rather the social value of a man to himself and his family or survivors. The economic gain to society, as I view it, is rather the value of the product over and above wages, cost of supervision, cost of material, and miscellaneous expenses, necessarily incurred to carry on any particular process of manufacture or industry. A fairly accurate basis for an estimate of this kind is furnished by the census returns of our manufacturing industries, which give employment to some seven million persons. While any calculation of this character must necessarily be merely approximate, it, however, will prove useful for the present purpose, to establish the principle that there is an economic value inherent in every year of a workman's life, and that every gain in human longevity above the age of fifteen and below the age of sixty-five represents a corresponding gain to the nation at large and a distinct contribution to the accumulated wealth and capital of the nation.

Variations in industrial efficiency.—It is probably safe to assume that the net gain to society is at least equivalent to about three hundred dollars per annum in the case of male wage-earners employed in American manufacturing and mechanical industries. The return is higher, among others, in the manufacture of food and kindred products, also in the manufacture of metal ware, paper, printing, and chemicals. It is lower, among others, in the manufacture of textiles, leather, clay, glass, stoneware, and tobacco. Making allowance also for the lower wages of women and the relatively small earnings of children below the age of fifteen in industries, which are included in the census returns, the average of three hundred dollars, assumed for the present purpose, would appear to fairly correspond to the facts of actual experience. Of course, the gain is less at the younger ages and probably remains fairly the same or level during the ages of thirty to fifty, when the normal physical strength is enhanced by practical trade education and experience. After the age of fifty a natural decline in physical strength and possibly brain weariness gradually decreases the industrial efficiency, which in the case of wage-earners may be held to come practically to an end by about the age of sixty-five to seventy. There are, of course, always some exceptions in every trade and industry, where men continue to work, sound in body and mind, to the close of a long life.

¹ "Physical and Medical Aspects of Labor and Industry," *Annals of the American Academy of Political and Social Science*, May, 1906.

Economic loss by premature mortality.—Upon the assumption of an average annual net gain to society of three hundred dollars as the result of individual labor applied to American industry under normal conditions, the degree of variation in value may be placed between the minimum of seventy-five dollars at the age of fifteen and a maximum of four hundred dollars at the age of thirty-two. The value is then assumed to remain about the same, or level, until the age of forty-eight, when industrial efficiency gradually declines as the result of decreasing strength and mental aptitude and inclination. The minimum value at the end of industrial life is assumed to be one hundred and seventy dollars. By means of this estimate, which, of course, is purely theoretical, in that there are no wage statistics by ages, or useful observations of employers of labor respecting the industrial efficiency of employees at different periods of life, it is possible to calculate with approximate accuracy the economic loss due to premature death or impaired physical efficiency as the result of illness. If, upon the basis of an average net gain to society of three hundred dollars per annum, the fifty active years of a workingman's life represent a total of fifteen thousand dollars, then if death should occur at the age of twenty-five, the economic loss to society would be thirteen thousand six hundred and ninety-five dollars; if at the age of thirty-five it would be ten thousand three hundred and ninety-five dollars; if at the age of fifty, four thousand four hundred and five dollars; and, finally, at the age of sixty, the loss would still be one thousand and ninety dollars. Of course, the values would vary considerably in different employments, but the broad principle is fairly well illustrated and with approximate accuracy in this calculation.

Now, the approximate average age at death of the persons dying from tuberculosis of the lungs (pulmonary "consumption") in the United States is practically about thirty-five years, a figure which has been curiously stationary for each year for which the statistics are available since 1860, although the average age at death from all causes has increased from 22.7 years in 1860 to 38.1 years in 1907.

YEAR.	Approximate average age at death from tuberculosis of lungs.	Approximate average age at death from all causes.	PER CENT OF DEATHS UNDER 5 YEARS OF AGE.		Approximate median age at death from tuberculosis of lungs.
			Tuberculosis of lungs.	All causes.	
United States:					
Census year 1860 ¹	34.9	22.7	7.9	42.7	30.9
Census year 1870.....	36.7	25.2	6.4	40.2	32.7
Census year 1880.....	35.7	26.9	5.2	37.9	31.2
Registration area:					
Census year 1890.....	35.3	31.1	3.9	34.6	31.6
Census year 1900.....	35.3	35.2	3.6	30.0	32.5
Calendar year 1900.....	35.3	35.1	3.5	30.4	31.8
Calendar year 1901.....	35.5	37.0	3.2	27.3	32.0
Calendar year 1902.....	35.5	36.3	3.0	28.2	32.1
Calendar year 1903.....	35.3	37.2	3.1	26.7	32.0
Calendar year 1904.....	35.1	37.5	2.9	26.5	31.8
Calendar year 1905.....	35.3	37.5	2.8	27.0	32.1
Calendar year 1906.....	35.5	36.8	3.1	28.4	32.3
Calendar year 1907.....	35.9	38.1	3.1	26.7	32.8

¹ Estimate based on ten-year periods from 30 years to 90 years.

As the average age at death is a very doubtful ratio, depending chiefly upon the average age of the population or special class susceptible to an individual disease, the figures given in the above table

must be cautiously used; subsidiary columns are given for the percentages of deaths under five years of age as affecting pulmonary tuberculosis and deaths from all causes, and also the approximate median age at death from tuberculosis of the lungs, which is the age for which one-half of the persons dying from this disease are older and one-half younger. The latter ratio is somewhat lower than the average age at death, and likewise shows only a slight variation during the series of years. As age at last birthday forms the basis of the compilation, one-half year may be added to show the true approximate average or median age at death.

Of the 42,734 deaths of males from all forms of tuberculosis in the registration area of the United States during 1907, 12,035, or 28.2 per cent, were at the ages 15 to 29 years, both inclusive; 14,423, or 33.8 per cent, at the ages 30 to 44 years; and 9,679, or 22.6 per cent, at the ages 45 to 64 years. During the younger and probably most efficient period of industrial activity, from 15 to 44 years, occurred 26,458, or 61.9 per cent (nearly two-thirds), of all of the male deaths from tuberculosis. And for the entire "fifty years of labor and life," as expressed by Mr. Hoffman, there were 36,137 deaths of men, or 84.6 per cent of the total male deaths from all forms of tuberculosis. So at least four-fifths of all of the deaths of males from this disease mean direct loss of earning power in men who are productively employed.

If we take the 26,458 deaths of men aged from 15 to 44 years in the registration area, 1907, and assume that their average age at death was about 35 years or somewhat less (from tuberculosis of lungs it was 31 years), then consider the economic loss to society, according to Mr. Hoffman's computation, to be \$10,395 at the age of 35, we shall have a total economic loss, *in the registration area alone*, from the deaths of this limited *most productive age class of males only*, during a single year of experience amounting to \$275,030,910. The registration area includes less than one-half of the population of the United States. It is not profitable to press such estimates too closely, but it is easy to see that there is a tremendous waste distributed throughout society, and pressing with the greatest cruelty upon the weakest dependent members of the families from which tuberculosis has removed the means of support.

For a thorough analysis of the effects of tuberculosis in limiting the productive capacity of man a life table must be employed. For this purpose Professor Westergaard¹ has computed the effect upon the life

Incidence of tuberculosis upon the most productive ages.

Westergaard's life table, excluding tuberculosis.

¹"The Horoscope of the Population of the Twentieth Century," Bulletin de l'Institut Internationale de Statistique, 1907, xvii, 103.

table of England, 1881-1891, upon the assumption that tuberculous diseases can be eliminated:

AGE.	ENGLISH LIFE-TABLE, 1881-1891.		TUBERCULOUS DISEASES ELIMINATED.		GAIN FROM ELIMINATION OF TUBERCULOUS DISEASES.	
	Males.	Females.	Males.	Females.	Males.	Females.
0 years.....	10,000	10,000	10,000	10,000	.....	.....
5 years.....	7,515	7,832	7,629	7,928	114	96
15 years.....	7,262	7,591	7,410	7,730	148	139
25 years.....	6,938	7,248	7,209	7,535	271	287
35 years.....	6,396	6,710	6,873	7,195	477	485
45 years.....	5,644	6,040	6,304	6,668	660	628
55 years.....	4,630	5,164	5,381	5,837	751	673
65 years.....	3,225	3,855	3,889	4,439	664	584
75 years.....	1,539	2,042	1,911	2,387	372	345
85 years.....	299	481	378	568	79	87
95 years.....	8	21	11	27	3	6

Out of 10,000 newborn children of each sex, 6,873 males and 7,195 females would reach the age of 35 provided tuberculous diseases could be done away with, as against 6,396 males and 6,710 females who would reach that age under present conditions. This represents a gain to the community of 477 males and 485 females at this single age period. The probability that a man aged 25 would reach the age of 35 under the conditions of the English life-table employed is 92.1 per cent; with tuberculosis eliminated it would be 95.3 per cent.

In the course of human life from infancy to old age each period has its peculiar perils. All over the world the babies are dying in unnecessary numbers from filth, foul milk, and the various causes of diarrhea and enteritis. After the ordeal of early infancy, the gantlet of measles, whooping cough, and scarlet fever must be run. Then come the comparatively immune days of early youth, when the death rate falls to its lowest ebb during the entire period of existence, and then the tide of death begins to rise, with the *Bacillus tuberculosis* as the chief causative agent, until, with advancing years, the degenerative changes, due chiefly to improper or unwise living, become of chief importance, and even tuberculosis must play a secondary rôle. In the practical everyday conflict with disease that is being waged by sanitary authorities, it is of importance to know just where to direct the attack—what causes of sickness and death are of the greatest relative importance, both at all ages and at the various special periods of life.

For all ages, according to the mortality statistics of the registration area of the United States during the year 1907, 11.2 per cent of the deaths from all causes were from some form of tuberculosis. Tuberculosis of the lungs alone was

Relative importance of tuberculosis and other diseases.

Table 7, page 56.

All ages.

(4), page 56.

responsible for 9.7 per cent of the total deaths of the year. Pneumonia, including bronchopneumonia, came next to tuberculosis as a cause of death, with a percentage of 9.8, then heart disease (8.6 per cent), violence (7.6 per cent), and diarrhea and enteritis (7.1 per cent).

For infants and children under 15 years of age, the percentage of deaths from all forms of tuberculosis (*according to the returns*) is low (4 per cent). But many of the deaths from meningitis (unqualified), "convulsions," and from diarrhea and enteritis are probably due to tuberculous infection. The story of the dealings of tuberculosis with infancy and childhood is not yet told in the statistics, nor will it be until physicians are much more careful in their certificates of cause of death, and, indeed, until science has rendered it less difficult to obtain precise information in many instances.

For youth and early manhood and womanhood (15 to 29 years of age), nearly a third (33.2 per cent) of all of the deaths are due to tuberculosis in some of its forms. For females the proportion is even higher (38.3 per cent). The mortality from no other cause approaches that from this disease, the nearest being violence (16.8 per cent), typhoid fever (7.4 per cent), pneumonia (6.7 per cent), and heart disease (4.3 per cent). Here is where the most immediately beneficial results of the active campaign against tuberculosis should first be perceived.

For mature manhood and womanhood (30 to 44 years) over a quarter (25.6 per cent) of all of the deaths are from tuberculosis, but the relative importance of the disease as a cause of death is less because of the increased fatality of other diseases. Violence (13.1 per cent), pneumonia (8.8 per cent), Bright's disease (7.5 per cent), and heart disease (7.1 per cent) are the next most important causes, and cancer (4.5 per cent) now makes its appearance as a considerable cause of death.

The period from 45 to 59 years is hard to designate; perhaps we may call it the harvest time of life, as it should be, after the exertions of mature manhood and womanhood and before the shadows of advancing years become too pronounced. Here tuberculosis ceases to be the most important cause of death; its proportion of the total (12.1 per cent) is reduced to one-half of that of the preceding period. This is because the degenerative diseases begin at these ages rapidly to increase in their effect upon the death rate. Violence declines (8.5 per cent) because the days of most active labor are over, but heart disease (12.5 per cent) now exceeds tuberculosis and becomes the leading cause of death; nephritis and Bright's disease (11 per cent) is close behind; and cancer (10.5 per cent) is almost equally important.

Advancing age yields fewer deaths in proportion from tuberculosis (4.6 per cent), while heart disease (17.4 per cent), nephritis and Bright's disease (11.5 per cent), apoplexy (10.5 per cent), and other organic affections absorb the lion's share. The death rate from tuberculosis is also diminishing, and in the final period of life, from 75 years of age upwards, the proportion of deaths from tuberculosis is less than in any of the preceding age periods.

Advancing age.
(F), page 58.

(G), page 59.

The relative frequency of deaths from tuberculosis as compared with other causes varies among the different states of the registration area. The deaths necessarily include those of nonresidents, many of whom are invalids who have resorted to the states in which their deaths occurred in search of health, and hence the relative proportion of deaths from tuberculosis or even the absolute death rate does not gage the natural healthfulness of the state with respect to tuberculosis. In California no less than 15 per cent of all deaths that occurred during the year 1907 were from tuberculosis; in Colorado even more, 16.4 per cent; while Michigan showed only 7.4 per cent, Vermont 8.1 per cent, and New Hampshire 7.6 per cent. But consumptives go from Michigan, Vermont, and New Hampshire to California and Colorado, and there is no systematic plan yet accepted whereby their deaths, should they occur in the latter states, may be charged back to the states in which the disease originated. For some valuable data on this point reference may be made to the recent registration reports published by the state board of health of California. The time will undoubtedly come, with the more general extension of the registration area, when it will be possible to establish equitable rules for this purpose.

The influence of color has already been referred to, although it is difficult to dissociate the influences of race and conditions of life as related to the production of an excessive mortality from tuberculosis. According to the returns from the registration area of 1900, the colored death rate from pulmonary tuberculosis (490.6 per 100,000 of colored population) exceeded the white death rate (173.5) by 182 per cent. Death rates of the colored included chiefly the residents of the nonregistration cities of the South. Until the admission of Maryland in 1906 as a registration state, there existed no appreciable amount of returns from rural colored population, so that all of the comparative death rates of white and colored must be taken with much caution.

Color.
Table 9, page 60.

According to the mortality statistics of the census year 1900, the death rate of unmarried males aged 15 years or over from tuberculosis of the lungs (309.8 per 100,000 persons of this class in the population) was considerably

Conjugal condition.
Table 10, page 60.

higher than that of unmarried females of the same ages (225.2). The death rates of married males and married females were practically the same (215.5 and 216.4, respectively), but with the widowed again, the male rate (465) considerably exceeded that of the female (235.1). For the three age periods shown, the highest death rate from pulmonary tuberculosis was that of widowers aged from 15 to 44 years (667), while the lowest rate was that of married women aged from 45 to 64 years.

The incidence of tuberculosis of lungs (pulmonary "consumption") as compared with other diseases upon the general classes of occupations may serve to draw some broad lines of distinction, but the groups of occupations are hardly sufficiently definite to yield results of much value. Moreover, the fact must be considered that they differ considerably in age distribution, and this is a very important factor of the death rate. Tuberculosis of lungs caused 376.8 deaths per 100,000 of the laboring and servant class in 1900, being the maximum rate shown for any class of occupations, and the lowest rate for tuberculosis of lungs, 147.2 per 100,000, was among those engaged in agriculture, transportation, and other outdoor employment.

More specific, and hence generally more valuable, information is obtainable from the examination of the death rates from tuberculosis of certain listed occupations of each sex, the statistics being limited to persons over 10 years of age employed in gainful occupations in the registration states during the census year 1900. Here again the difference in age constitution of the persons employed must be considered, and data upon this point are available for the most important occupations shown in the volume on Vital Statistics, Part I, of the Twelfth Census reports, to which reference should be made.

The highest death rate from tuberculosis of the lungs per 100,000 of persons of specified occupation in the population in 1900 was that of marble and stone cutters (540.5), followed by that of cigarmakers and tobacco workers (476.9), compositors, printers, and pressmen (435.9), servants (430.3), and bookkeepers, clerks, and copyists (398). Laborers (not agricultural) showed a high rate (370.7), but farmers, planters, and farm laborers had one of the lowest rates for males in the list (111.7). Occupational mortality is one of the most important features in vital statistics, but it is subject to many practical difficulties in the collection of the data, which come from two sources, namely, the enumerators' returns of population and the registration returns of deaths. Unless the statement of occupation is identical for the population and for the deaths, there is much risk of overstatement or understatement of the mortality from a given occupation. Hence

Relative prevalence of tuberculosis by classes of occupations.

Table 11, page 60.

Rates of tuberculosis for specified occupations.

Table 12, page 65.

Occupations most subject to tuberculosis.

special caution is recommended in employing comparative occupational rates of mortality.

The death rates due to all forms of tuberculosis may be studied for the years for which the annual reports on mortality statistics have been compiled, but it should be remembered that a considerable addition was made to the registration area in 1906, and that in consequence thereof some of the relations between its main subdivisions are disturbed. Comparisons between the years 1907 and 1906 need no correction, nor are corrections required in examining the rates for the individual states and cities.

The total death rate of the registration area from all forms of tuberculosis in 1907 (183.6 per 100,000 of population) was slightly less than in 1906 (184.2), and all of the main subdivisions showed a decrease except the rural part of registration states, which increased from 140.4 to 142.5.

Six of the fifteen registration states showed increased mortality from tuberculosis, but the changes are well within the limits of the ordinary annual fluctuations. The highest death rates, by states, in 1907, were those of Colorado (289.4) and California (278.9), both favorite resorts for the tuberculous; Rhode Island (200.9), very densely populated and largely urban; and Maryland (200.2), with its large colored population. The lowest rates were in Michigan (103.5), South Dakota (105.1), New Hampshire (130.5), and Vermont (131.2).

For San Francisco recent rates can not be given because of the difficulty in estimating population since the earthquake of 1906. The immensely high mortality of Denver (486.6) is due to the inclusion of the deaths of nonresident tuberculous invalids, as is also that of the Bronx borough (512.6), which includes hospitals receiving patients from Manhattan and other boroughs of Greater New York. For a fuller study of the variations of mortality in the individual cities reference should be made to the detailed data in the annual reports.

II.—THE WORK OF THE BUREAU OF THE CENSUS IN VITAL STATISTICS.

In order to obtain a correct idea of the relation of the Bureau of the Census to the registration of vital statistics, and incidentally to cast some light upon the validity of the results obtained and to suggest means of improvement, the mechanism of the registration and compilation of vital statistics must be studied.

The working force of the Bureau of the Census, formerly, and still informally, known as the "Census Office," is divided into four princi-

Death rates from tuberculosis (all forms) by states and cities.

Table 13, page 66.

the years for which the annual reports on mortality statistics have been compiled, but it should be remembered that a considerable addition was made to the registration area in 1906, and that in consequence thereof some of the relations between its main subdivisions are disturbed. Comparisons between the years 1907 and 1906 need no correction, nor are corrections required in examining the rates for the individual states and cities.

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The working force of the Bureau of the Census, formerly, and still informally, known as the "Census Office," is divided into four princi-

pal "divisions" in accordance with the chief lines of statistical inquiry. These are:

- (1) Division of Population.
- (2) Division of Manufactures.
- (3) Division of Agriculture.
- (4) Division of Vital Statistics.

Before the organization of the permanent Census Office in 1902, the work of the Census was necessarily confined to the compilation of data collected by or during the decennial enumerations. While the material necessary for statistics of population, manufactures, and agriculture, can be so obtained, it was recognized at a very early date that vital statistics could not be collected satisfactorily by enumeration, and, beginning with the Tenth Census, 1880, an effort was made to obtain better returns of deaths by substituting the results of immediate registration, under laws requiring burial permits, as conducted by certain states and cities. The registration area thus instituted has increased until at present it comprises nearly one-half (48.8 per cent in 1907) of the total population of continental United States; and with the effective enforcement of new laws already in operation or likely to be passed in 1909, it is possible that it will embrace nearly two-thirds of the entire population at the date of the Thirteenth Census, 1910.

Taking a typical state of the registration area as an example, the following processes would occur in the registration and compilation of a death:

1. The undertaker or, in the absence of an undertaker, the person in charge of the interment, removal, or other disposition of the body, takes a blank certificate of death provided him by the state registration office, (1) has it filled out with the name, sex, age, color, conjugal condition, occupation, and other personal particulars concerning the decedent and signed by a relative, friend, or other person acquainted with the facts; then (2) presents the certificate thus far filled out to the attending physician, or coroner in certain cases of violent death, who fills out the medical certificate of cause of death; and finally (3) delivers it to the local registrar of death *before the interment, removal, or other disposition of the body.*

Duty of undertaker, relative, and attending physician.

2. The local registrar receives and examines the certificate delivered to him by the undertaker, and if it is properly executed, issues a burial permit or a removal permit to the undertaker, which authorizes him to proceed with the interment or removal of the body.

Duty of local registrar.

3. The local registrar should record the death in his register before issuing a permit, as he is thus more apt to detect omissions. He may

index the local register for convenient reference, and in cities he frequently makes a weekly, monthly, or annual compilation of mortality statistics for local sanitary purposes. Soon after the close of the month (e. g., on the fourth day of the following month in Michigan, on the fifth in Pennsylvania) he sends to the state registrar all of the original certificates of death registered with him for the month or, if no deaths occurred, makes a postal card report of "no deaths."

4. The state registrar receives monthly the prompt returns of deaths from each local registration office, and by means of the reports of "no deaths" is enabled to know that each district of the state has reported all of the deaths that have occurred. He examines the returns, obtains necessary corrections for items imperfectly filled out, and in general sees that the law is uniformly and effectively enforced throughout the state. The returns are indexed and such statistical compilations are made and published in monthly bulletins and annual reports as may be required for state use.

5. Under the census law, the Director is authorized to obtain transcripts of certificates of death from such states and cities "as in the discretion of the Director possess records affording satisfactory data in necessary detail," and these transcripts are made out for each death upon an individual blank in the exact form of the Standard Certificate. Formerly these transcripts were sent in annually or semiannually, but an effort is being made to secure prompt monthly returns to Washington of the transcripts from the registration states and cities, so that the annual report on Mortality Statistics may be compiled and published at an earlier date.

6. On arrival at the Census Office the transcripts are examined, and corrections of imperfect data are obtained so far as possible; the transcripts are then "edited," that is, the numbers corresponding to the classification of causes of death, occupations, etc., are inserted in readiness for the next process of compilation.

7. From the perfected transcript of a death all of the statistical information required for compilation is transferred to a card by means of a punch. The punched cards are then compiled by means of electric tabulating machines, which record on many dials the various items necessary for the statistical tables. The resulting tables, arranged and edited, constitute the annual report on Mortality Statistics, which is distributed to state and city sanitary authorities, physicians, foreign governments, etc., and is for the use of all persons interested in the condition of the public health of the United States.

WRITE PLAINLY, WITH UNFADING INK—THIS IS A REQUIREMENT

N. B.—Every item of information should be carefully supplied. AGE should be stated EXACTLY. PHYSICIANS should state CAUSE OF DEATH in plain terms, that it may be properly classified. The "Special Information" for persons dying away from home should be given in every instance.

PLACE OF DEATH County of _____ Township of _____ or Village of _____ or City of _____ DEN [If death occurs away from USUAL RESIDENCE give facts called for under "Special Information."
PERSONAL
SEX Male
DATE OF BIRTH _____
AGE 24 _____y
SINGLE, MARRIED, WIDOWED, OR DIVORCED
BIRTHPLACE (State or country)
NAME OF FATHER
BIRTHPLACE OF FATHER (State or country)
MAIDEN NAME OF MOTHER
BIRTHPLACE OF MOTHER (State or country)
OCCUPATION
THE ABOVE STATED BEST OF MY KNOWLEDGE
(Informant) _____
(Address) _____
Filed _____
_____ 190

PLACED IN THE CHARGE OF THE REGISTRAR OF DEATHS
O. L. GRADY
Dec. 9, 1907.
Tuberculosis
3 yrs.
W. W. Dubois
Missouri
Illinois
JAN 10 1908
JAN 10 1908

WRITE PLAINLY, WITH UNFADING INK—THIS IS A PERMANENT RECORD.

M. B.—Every item of information should be carefully supplied. AGE should be stated EXACTLY. PHYSICIANS should state CAUSE OF DEATH in plain terms, that it may be properly classified. The "Special Information" for persons dying away from home should be given in every instance.

PLACE OF DEATH

BUREAU OF THE CENSUS
STANDARD CERTIFICATE OF DEATH.
COLORADO.

County of DENVER,

3436

Township of _____

or

Village of _____

City of DENVER,

(No. 1127 W. Cedar St.; Ward)

Registered No. _____

[If death occurred in a Hospital or Institution, give its NAME instead of street and number.]

[If death occurs away from USUAL RESIDENCE give facts called for under "Special Information."]

John Doe

FULL NAME _____

PERSONAL AND STATISTICAL PARTICULARS

MEDICAL CERTIFICATE OF DEATH

SEX Male COLOR White

DATE OF DEATH Dec. 9, 1907. 190 (Month) (Day) (Year)

DATE OF BIRTH _____ (Month) (Day) (Year)

I HEREBY CERTIFY, That I attended deceased from _____ 190 to _____ 190

AGE 24 years, 3 months, 2 days

that I last saw h. _____ alive on _____ 190

SINGLE, MARRIED, WIDOWED, OR DIVORCED Single

and that death occurred, on the date stated above, at _____

BIRTHPLACE (State or country) Missouri

M. The CAUSE OF DEATH was as follows: Pulmonary Tuberculosis 4-0

NAME OF FATHER _____

(DURATION) 3 yrs. DAYS

BIRTHPLACE OF FATHER (State or country) Indiana

Contributory _____

MAIDEN NAME OF MOTHER _____

(DURATION) _____ DAYS

BIRTHPLACE OF MOTHER (State or country) Missouri

(Signed) W.W. Butman M. D.

OCCUPATION Bookkeeper 0-6

_____ 190 (Address)

THE ABOVE STATED PERSONAL PARTICULARS ARE TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF

SPECIAL INFORMATION only for Hospitals, Institutions, Transients, or Recent Residents.

(Informant) _____

Former or Usual Residence Missouri How long at Place of Death? _____ Days

(Address) _____

Where was disease contracted, Illinois If not at place of death? _____

Filed _____

PLACE OF BURIAL OR REMOVAL Macon, Mo. DATE OF BURIAL _____ 190

_____ 190

UNDERTAKER _____ ADDRESS _____

Registrar

3438

R-S R-C A		Month - Un		Age		Con Cond		Ep-F		Ep Mother		Mortality	
R	S	Ct	A	Month	Un	Age	Con Cond	Ep-F	Ep Mother	Occ	Occ	Occ	Mortality
0	1	0	0	Jan	Feb	40	DV	US	US	NO	Hunt	0	0
1	0	1	1	Apr	May	45	Un	For	For	Rus	Ger	1	1
2	1	2	2	Jul	Aug	50	95 +	Un	Un	NO	E-W	2	2
3	2	3	3	Oct	Nov	55	Un	Un	Un	NO	Can	3	3
4	3	4	4			60	Un	Un	Un	NO	NY	4	4
5	4	5	5			65	Un	Un	Un	NO	Sve	5	5
6	5	6	6			70	Un	Un	Un	NO	DK	6	6
7	6	7	7			75	Un	Un	Un	NO	For	7	7
8	7	8	8			80	Un	Un	Un	NO	For	8	8
9	8	9	9			85	Un	Un	Un	NO	For	9	9
10	9	10	10			90	Un	Un	Un	NO	For	10	10
11	10	11	11			95	Un	Un	Un	NO	For	11	11
12	11	12	12			100	Un	Un	Un	NO	For	12	12

FACSIMILE OF PUNCHED MORTALITY CARD.

It is evident from the foregoing outline, that accurate mortality statistics are dependent upon the faithful service and cooperation of many individuals. Requisites for accurate mortality statistics. It is necessary that there should be—

1. Obedience to the law on the part of the undertaker.
2. Care in filling out the statement of age, occupation, etc., by a relative or friend of the deceased person.
3. Care and special knowledge on the part of the attending physician or coroner in stating the cause of death.
4. Interest and care on the part of the local registrar in seeing that the certificates of death filed with him are completely and properly filled out and that all deaths that occur in his jurisdiction are promptly registered and returned by him to the state office.¹
5. Alert supervision by the state registrar so that the law will be thoroughly enforced in all parts of the state, with the will and power to compel obedience on the part of undertakers, physicians, and local registrars when necessary.
6. Careful examination of returns by the state registrar and prompt securing of missing data or correction of imperfect statements of cause of death.
7. Accurate copying (which implies comparison) of the original certificates upon the transcripts sent to the Bureau of the Census.
8. Prompt examination of transcripts upon receipt by the Bureau of the Census, and correspondence for corrections.
9. Careful "editing," especially for classification of causes of death, by expert compilers thoroughly acquainted with the International Classification and with the use of medical terms.
10. Accurate transferal of data to the punched tabulation card. These are "compared back" with the original transcripts to insure correctness.

11. Careful tabulation of punched cards. Electrical tabulating machinery has reduced this to a mechanical basis and thus largely eliminated the "personal equation."

12. Lastly, the editorial work proper, or the analysis of the figures presented in a registration report. The analysis is subject to error, but the figures themselves stand as witnesses of their own significance.

The chief difficulties in obtaining accurate statistics of the mortality from tuberculosis (or any other disease) for the United States are due to the following Chief difficulties in obtaining statistics of tuberculosis. causes:

1. Adequate laws, with the requirement of compulsory burial permits, do not yet exist in a large portion of the United States. Attempts to collect data concerning deaths by assessors, or through

¹ See Census pamphlet No. 101, "Practical Registration Methods," which is designed to aid the local registrar in his work.

county officers, or by direct reports from physicians or undertakers, without the rigid requirement of burial permits issued by a local registrar, are futile and worse than useless so far as reliable mortality statistics are concerned.

The remedy for this lies in the passage and enforcement of adequate laws, and the American Medical Association, the Conference of Commissioners on Uniform State Laws, and the American Public Health Association have united with the Bureau of the Census in recommending a model bill for the consideration of state legislatures at their approaching sessions. The Bureau of the Census has been earnestly engaged in this work—the extension of the registration area—ever since its establishment on a permanent basis enabled it to plan for the future, instead of being concerned alone with the tabulation of past results. Its efforts in this respect have been attended with signal success in Pennsylvania¹ and other states, and Congress has especially commended the movement in the following joint resolution:

JOINT RESOLUTION REQUESTING STATE AUTHORITIES TO COOPERATE WITH CENSUS OFFICE IN SECURING A UNIFORM SYSTEM OF BIRTH AND DEATH REGISTRATION.

Whereas the registration of births and deaths at the time of their occurrence furnishes official record information of much value to individuals; and

Whereas the registration of deaths, with information upon certain points, is essential to the progress of medical and sanitary science in preventing and restricting disease and in devising and applying remedial agencies; and

Whereas all of the principal countries of the civilized world recognize the necessity for such registration and enforce the same by general laws; and

Whereas registration in the United States is now confined to a few states, as a whole, and the larger cities, under local laws and ordinances which differ widely in their requirements; and

Whereas it is most important that registration should be conducted under laws that will insure a practical uniformity in the character and amount of information available from the records; and

Whereas the American Public Health Association and the United States Census Office are now cooperating in an effort to extend the benefits of registration and to promote its efficiency by indicating the essential requirements of legislative enactments designed to secure the proper registration of all deaths and births and the collection of accurate vital statistics, to be presented to the attention of the legislative authorities in nonregistration States, with the suggestion that such legislation be adopted: Now, therefore,

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Senate and House of Representatives of the United States hereby expresses approval of this movement and requests the favorable consideration and action of the State authorities, to the end that the United States may attain a complete and uniform system of registration.

Approved February 11, 1903.

¹ See Census pamphlet No. 106, "Extension of the Registration Area for Births and Deaths." See also Census pamphlet No. 108, "Legal Importance of Registration of Births and Deaths," copies of which are obtainable at the Census exhibit of the International Congress on Tuberculosis.

2. Where fairly efficient laws exist there is frequent difficulty in obtaining from physicians correct statements of the causes of death. This is due to two reasons: (1) Lack of a uniform and plainly comprehensible blank for the medical statement of cause of death, with explicit instructions for its use;¹ (2) lack of uniform *nomenclature*² of diseases, which results in a difficulty in understanding just what the physician meant in his statement.

The question of the form of blank has been solved, to a considerable extent, by the adoption of the Standard Certificate by many states and cities. Unfortunately all do not use it, and the Section on Vital Statistics of the American Public Health Association has rendered a great service by recommending, at its recent meeting at Winnipeg, August, 1908, the exclusive use of an improved form of the Standard Certificate by all registration offices in the United States after January 1, 1910.

The question of nomenclature of diseases has also been taken up in a practical way by a committee of the American Medical Association, whose chairman is Dr. Frank P. Foster, of New York. This committee is cooperating with special committees appointed by other national medical organizations, and with the Government medical services (Army, Navy, and Public Health and Marine-Hospital Service), and with the Bureau of the Census. As a result of its labors, it will be possible for the physicians of the United States to have a standard of reference for the use of medical terms, and for the Bureau of the Census to cooperate with state and city officials in recommending the use of authorized terms to report causes of death.³ The vital statistics of the future must be statistics of greater precision, for they are to be the working tools of an aggressive scientific public health administration.

III.—HOW THE INTERNATIONAL CONGRESS ON TUBERCULOSIS CAN PROMOTE THE PREVENTION OF TUBERCULOSIS BY INSISTING UPON THE NECESSITY FOR COMPLETE REGISTRATION OF DEATHS THROUGHOUT THE UNITED STATES.

Une statistique générale de la tuberculose ne peut être établie convenablement qu'au moyen d'une statistique générale des causes de décès établie selon une nomenclature comparable de pays à pays et spécifiant les principales maladies qui peuvent être confondues avec la tuberculose (bronchite chronique, méningite, etc.). La nomenclature dite "internationale" est particulièrement recommandable.—Dr. Jacques Bertillon.

¹ See Census pamphlet No. 107, "Modes of Statement of Causes of Death and Duration of Illness upon Certificates of Death."

² The International Classification of Causes of Death is not a complete *nomenclature* of diseases.

³ As by Census pamphlet No. 102, "Relation of Physicians to Mortality Statistics," a new edition of which will be prepared.

The above quotation from Doctor Bertillon's valuable paper on "Comment doivent être établies les statistiques relatives à la tuberculose dans les villes, dans les campagnes, dans les hôpitaux, dans les sanatoriums," read before the International Institute of Statistics at its session held at Copenhagen in 1907, is presented for its direct bearing upon the proper method of obtaining general statistics of tuberculosis. Such statistics are a part of general mortality statistics, and the whole list of causes of death must be studied in connection with them. Moreover, in the United States we must first obtain our general mortality statistics for a considerable part of the country, since it is useless to expect statistics for an individual disease unless all deaths are registered as they occur.

The following abstract of the address of the chief statistician for vital statistics of the Bureau of the Census as chairman of the Sub-section on "Collection of Statistics" of Section VI, "State and Municipal Control of Tuberculosis," of the International Congress on Tuberculosis, contains a preliminary draft of certain resolutions whose sanction by the Congress, and whose practical recognition by the sanitary agencies now interested in the control of tuberculosis, would be of the utmost service in securing adequate mortality statistics for the United States, and thus providing the means by which the warfare against tuberculosis, and against all other diseases which may be controlled by man, will be vitally aided:

COLLECTION OF STATISTICS OF TUBERCULOSIS.

[Abstract.]

In efforts for the "State and Municipal Control of Tuberculosis," the first and most obvious step is to ascertain the amount of tuberculosis present in a given country, state, or city; the forms and conditions of its occurrence; its natural fluctuations; and thus to be enabled to measure the value of procedures undertaken for its prevention and restriction. This implies—

Registration of deaths and notification of sickness from tuberculosis.

(a) Registration (notification) of all cases of tuberculosis.

(b) Registration of all deaths from tuberculosis.

Subdivided by character of area, we have—

1. National registration of tuberculosis—

(a) Sickness.

(b) Deaths.

2. State registration of tuberculosis—

(a) Sickness.

(b) Deaths.

3. Municipal registration of tuberculosis—

(a) Sickness.

(b) Deaths.

The registration of sickness and deaths from tuberculosis is of value to a sanitary administration not only for the statistical information afforded but as an administrative means whereby the health officer may come into close touch with cases of tuberculosis, as soon as they are recognized by the attending physicians, and thus be enabled to instruct the patients, their families, friends, and neighbors in regard to the necessary precautions to prevent infection of other persons, and to give helpful general advice.

It is not worth while to attempt anything less than *complete* registration of all cases of sickness and death from tuberculosis. This is especially true from the point of view of the statistical data collected.

Complete statistics are essential.

Imperfect statistics based upon incomplete returns may be misleading and worse than useless. Accurate registration of sickness from tuberculosis should be of much greater value to a sanitary administration than the accurate registration of deaths, and is of particular importance to the tuberculous sick. For the individual the accounts are closed when it comes to the mortality statistics. The registration of all cases of sickness from tuberculosis or from any other disease presents extreme difficulties, however, especially in the United States; *it is futile to expect even approximately correct returns of sickness when the deaths themselves are not recorded, as is the case in a large portion of the United States.* The first and absolutely necessary step is, therefore, to insure the complete registration of all deaths, including those of tuberculosis, and the Congress on Tuberculosis should commend, and its members in the United States should earnestly support, the organized efforts made to secure the extension of the registration area in this country. The following resolutions may be submitted under this head:

A. INDISPENSABLE IMPORTANCE OF REGISTRATION OF SICKNESS AND DEATHS FROM TUBERCULOSIS.

1. The registration of sickness and deaths from tuberculosis is of indispensable importance to a sanitary administration which undertakes to combat this disease, and the registration (notification) of sickness from tuberculosis should be of special benefit to the tuberculous sick, to their medical attendants, and to their families and friends. For its full value, especially for administrative and statistical purposes, such registration ought to be complete; and it should be considered a paramount duty by legislators, sanitary officials, the medical profession, and the press and public, to bring about such complete and effective registration of all deaths and sickness from tuberculosis.

Preliminary draft of resolutions proposed.

2. The first step, in the United States, must be to secure the proper registration of all deaths, from whatever cause; the registration of deaths from tuberculosis is merely a part, although a very important one, of the general problem. It is useless to attempt adequate registration of sickness when deaths are not registered. The organized efforts and cooperation of the American Medical Association, the American Public Health Association, the Conference of Commissioners on Uniform State Laws, the United

States Public Health and Marine-Hospital Service, and the United States Bureau of the Census, to secure the adoption and enforcement of adequate laws for the proper registration of deaths and the extension of the registration area of the United States, are, therefore, most cordially commended by the Congress on Tuberculosis as affording the first and absolutely indispensable means for the control and final suppression of tuberculosis in this country, and all who are interested in the movement for its control are earnestly requested to help to secure the necessary legislation, and to support it when secured and to seek to educate public sentiment on this subject, to the end that the United States may attain a complete and uniform system of registration.

The comparability of international statistics of tuberculosis should be assured. This requires a knowledge of the various systems of classification in use, and also of the tendency among physicians to report deaths under terms that may be classified under titles having no apparent relation to tuberculosis. The use of the International Classification should be indorsed,¹ as its general acceptance will remove many of the difficulties now inherent in comparing the statistics of one country with those of another. The International Commission for regular decennial revision of the International Classification will meet in 1909, and the Congress on Tuberculosis should make specific recommendations relative to the form in which the statistics of morbidity and mortality from tuberculosis should be presented, so that they may show most satisfactorily the true incidence of the disease upon the various classes of population, and under different environments, and may be more closely in harmony with practical clinical classifications. The medical profession should be educated to present, and the people to demand the TRUTH about the occurrence of this disease; the failure to report tuberculosis as a cause of sickness or death, when such reports are required by law, or the making of a false report to conceal the presence of this disease, should consequently be considered a dishonorable professional act on the part of any medical attendant; and any regulations of insurance companies or other institutions tending to the falsification of the reports of tuberculosis should be considered as contrary to public policy. The following resolutions are proposed:

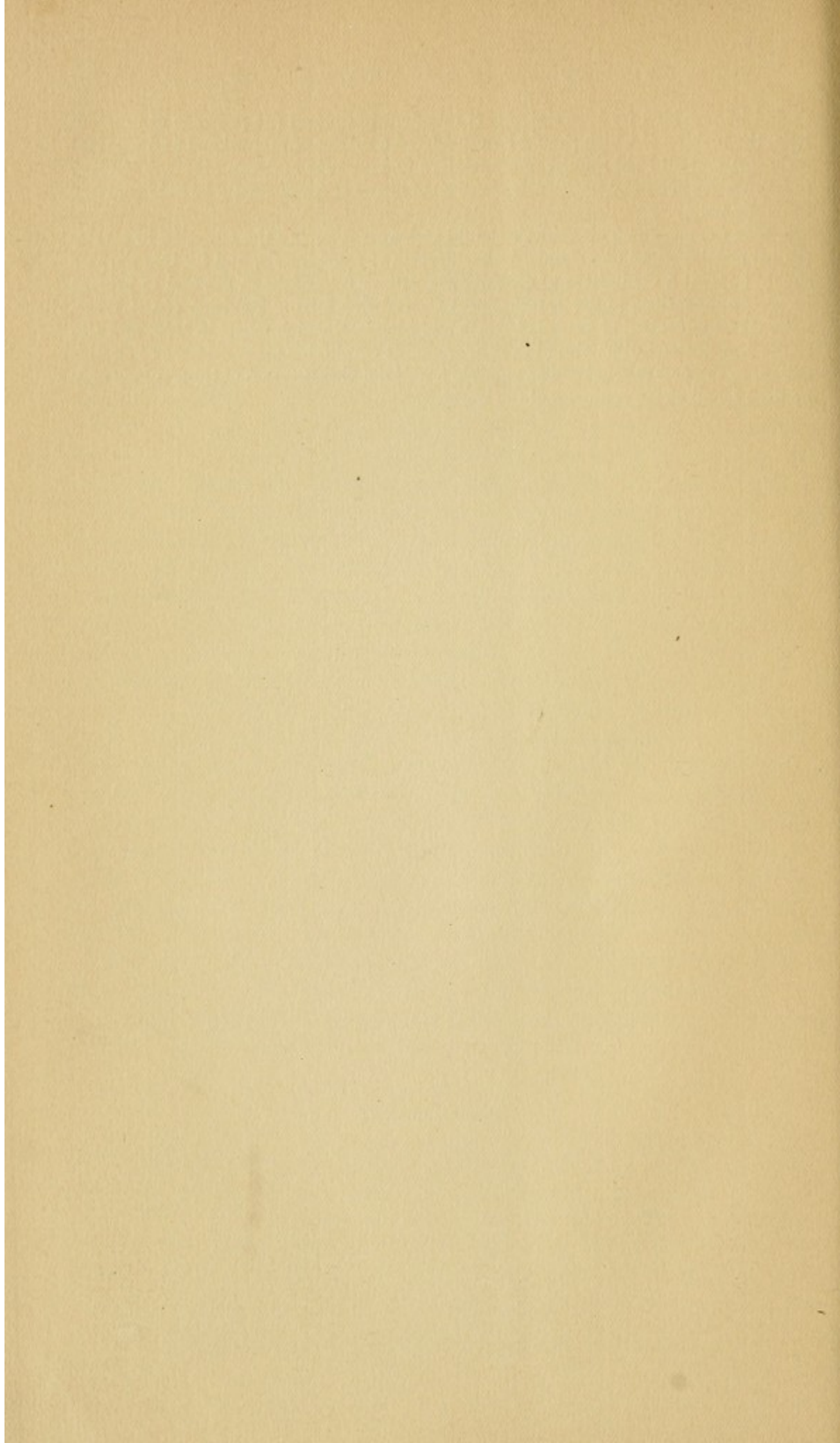
B. NECESSITY FOR UNIFORM STATISTICAL CLASSIFICATION AND ACCURATE REPORTING OF TUBERCULOSIS.

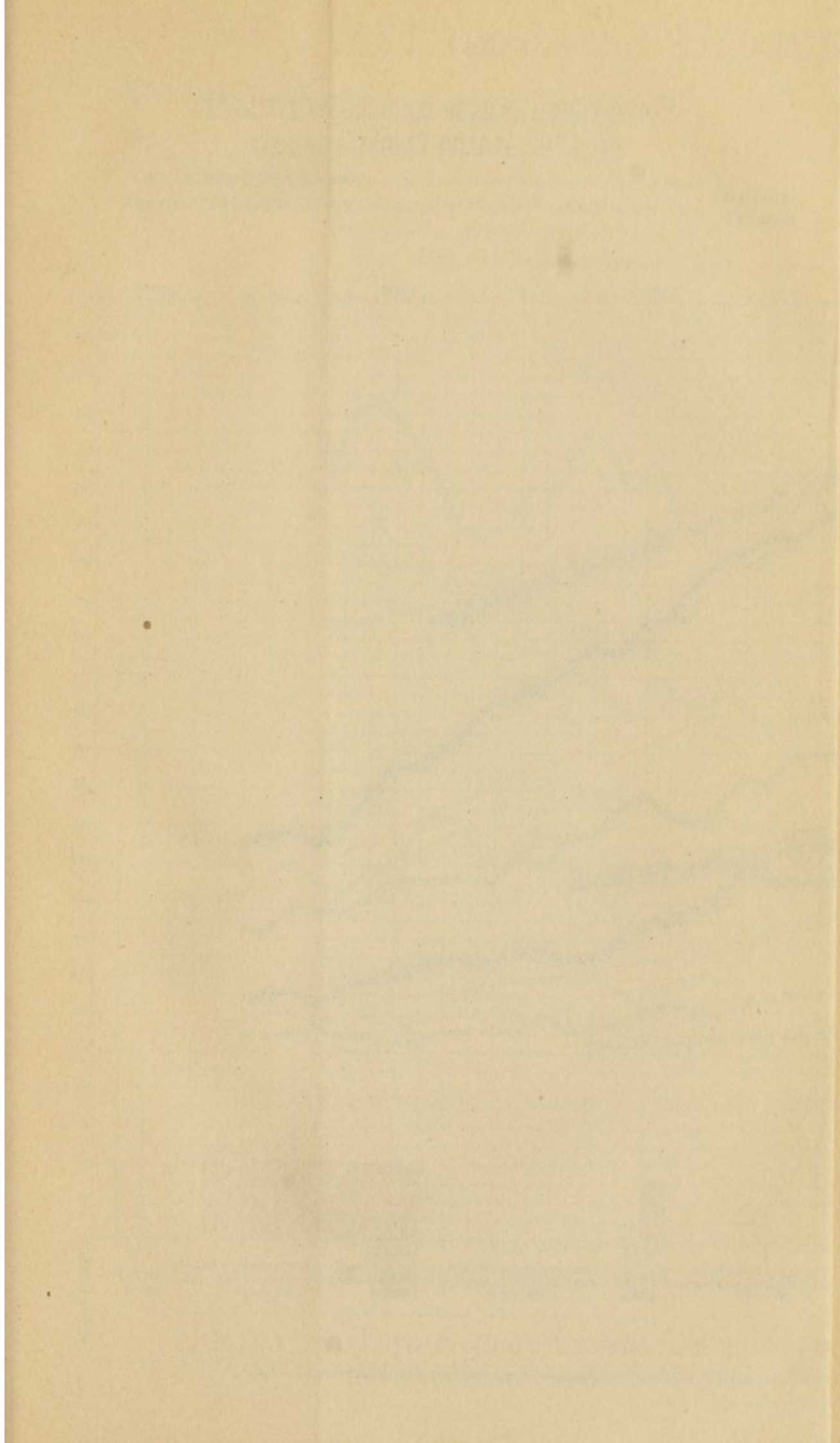
1. All statistics of tuberculosis, whether national, state, or municipal, and also statistics of hospitals and institutions, should be thoroughly comparable, both for the statistics of sickness and of deaths. Physicians should confine themselves to the accepted terms of the standard classification, and doubtful reports ("possibly tuberculous") should be systematically investigated by sanitary and registration authorities. A penalty

¹At the recent meeting of the American Medical Association at Chicago, June, 1908, the House of Delegates unanimously resolved "that the International Classification of Diseases and Causes of Death be recommended for all official morbidity and mortality statistical reports."

should be provided for false statements intended to conceal the presence of tuberculosis, the making of which should be considered a matter of professional and personal dishonor; and all legal requirements relative to insurance and other matters tending to falsification of official statements of causes of illness or death should be held contrary to public policy.

2. The Congress on Tuberculosis should endeavor to secure the adoption in all statistical classifications of a standard classification of tuberculosis, and for this purpose should appoint a Committee to consider the various forms now in use and to present its recommendations to the International Commission for the Revision of the International Classification of Causes of Death and Sickness, which meets in 1909, and also to the registration authorities of the governments employing other systems of classification, to the end that as soon as possible a uniform classification of tuberculosis may be used by all of the countries of the world.

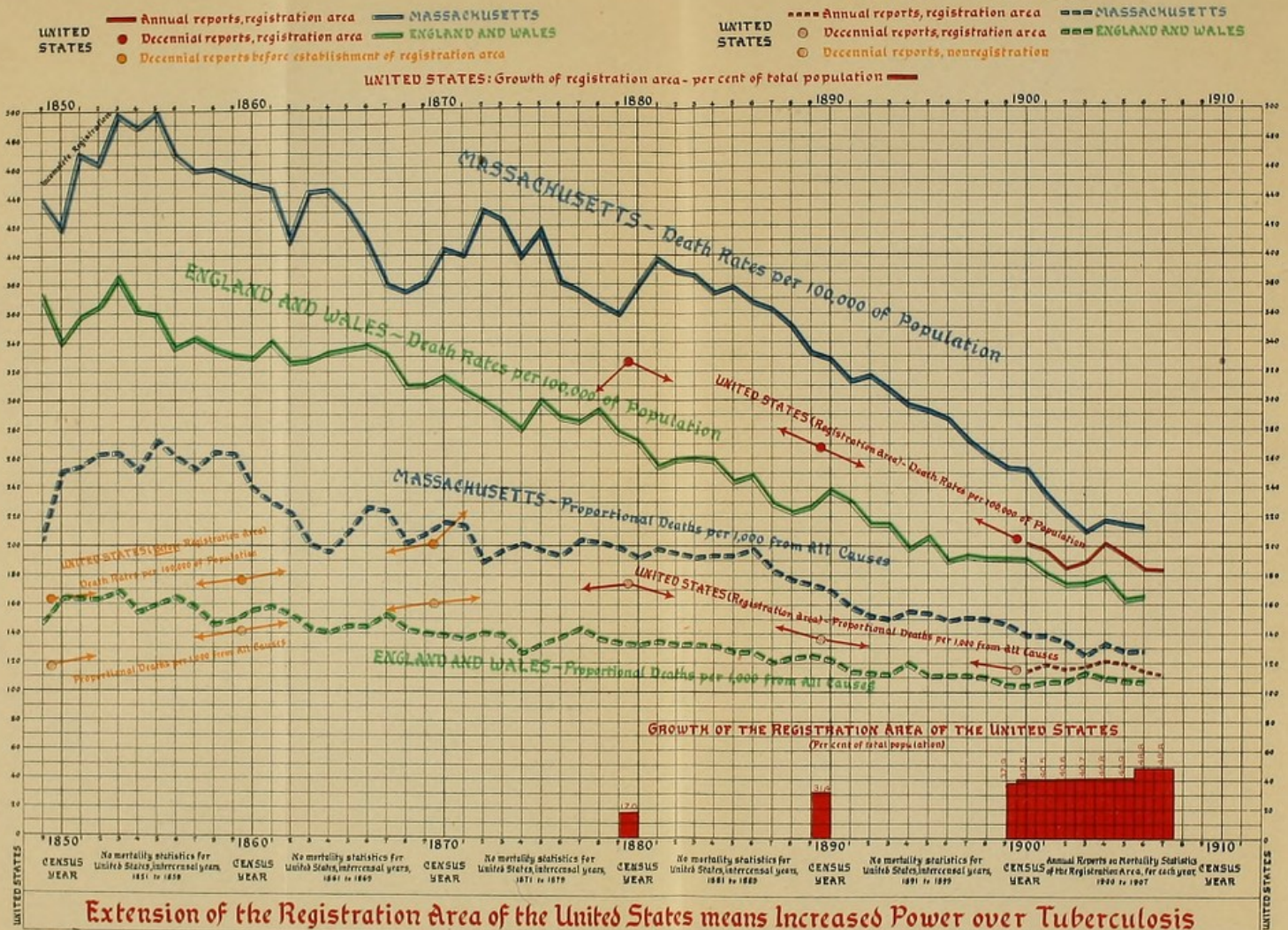




SIXTY YEARS OF TUBERCULOSIS (all forms)

DEATH RATES PER 100,000 OF POPULATION

Proportional Deaths from TUBERCULOSIS
per 1,000 Deaths from all causes



REFERENCE TABLES.

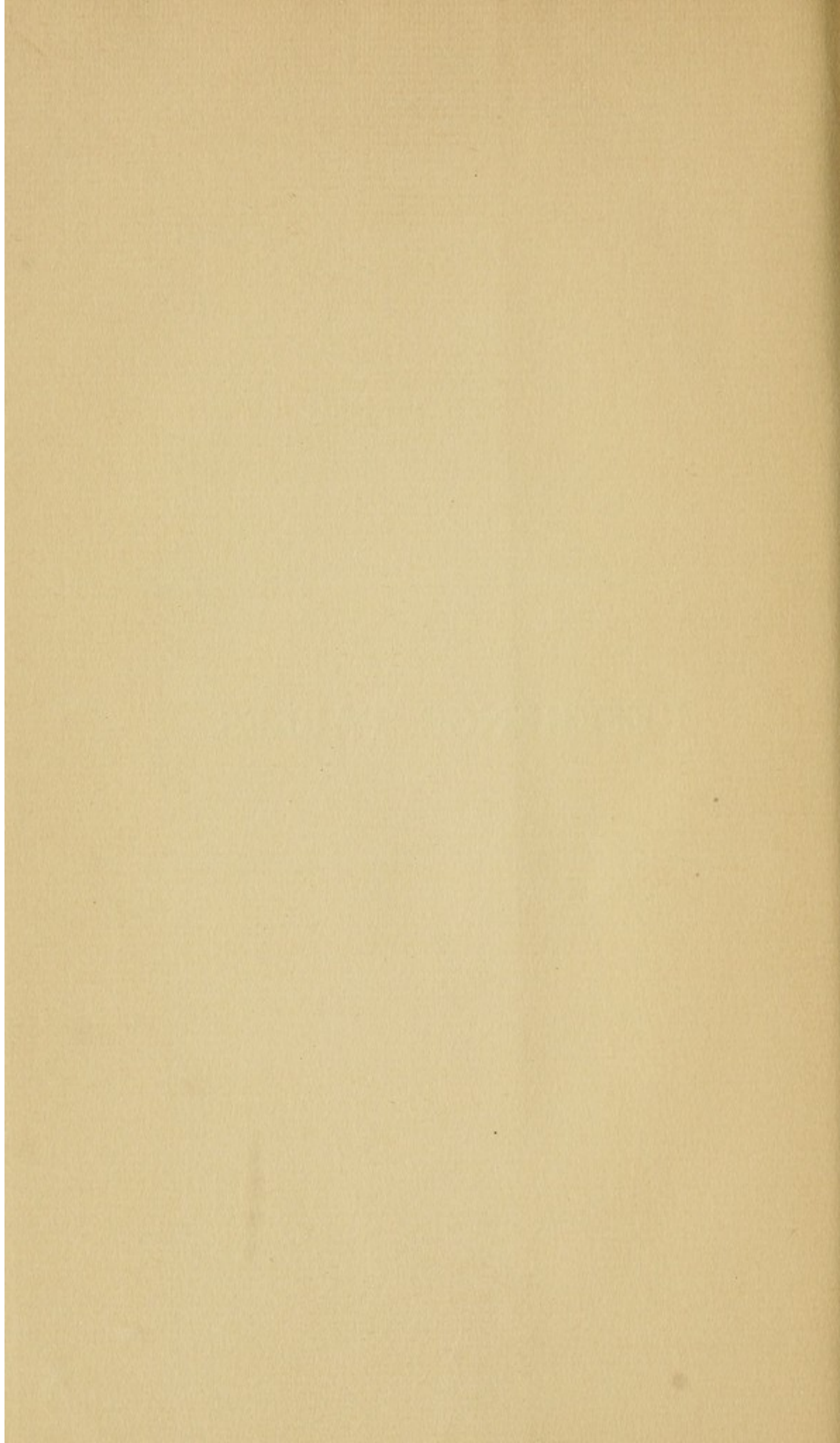


TABLE 1.—Death rates and proportional deaths (to all causes) from all forms of tuberculosis in the United States, Massachusetts, and England and Wales, for each year since the middle of the last century.

YEAR OR TEN-YEAR PERIOD.	MASSACHUSETTS.				UNITED STATES. (Registration area beginning in 1880.)				ENGLAND AND WALES.				
	Midyear population. ¹	Number of deaths from tuberculosis (all forms).	Death rate for tuberculosis (all forms) per 100,000 of population.	Deaths from tuberculosis (all forms) per 1,000 of total deaths.	Population on June 1.	Per cent in registration area.	Number of deaths from tuberculosis (all forms).	Death rate for tuberculosis (all forms) per 100,000 of population.	Deaths from tuberculosis (all forms) per 1,000 of total deaths.	Midyear population. ¹	Number of deaths from tuberculosis (all forms).	Death rate for tuberculosis (all forms) per 100,000 of population.	Deaths from tuberculosis (all forms) per 1,000 of total deaths.
1849.....	965,000	4,215	436.8	206.4	23,191,876	.....	* 37,605	162.1	.....	17,565,000	2 65,203	371.2	147.9
1850.....	994,000	4,153	417.8	250.1	.....	.....	.....	.....	116.6	17,773,000	2 60,395	339.8	163.7
1851.....	1,021,000	4,793	469.4	253.1	.....	.....	.....	.....	.....	17,983,000	2 64,075	356.3	162.1
1852.....	1,048,000	4,844	462.2	262.1	.....	.....	.....	.....	.....	18,193,000	2 66,163	363.7	162.5
1853.....	1,075,000	5,335	495.3	262.8	.....	.....	.....	.....	.....	18,404,000	2 70,615	383.7	167.7
1854.....	1,103,000	5,373	487.1	250.9	.....	.....	.....	.....	.....	18,616,000	2 67,145	360.7	153.3
1855.....	1,132,000	5,640	498.2	271.2	.....	.....	.....	.....	.....	18,829,000	2 67,520	358.6	158.6
1856.....	1,151,000	5,396	468.8	260.2	.....	.....	.....	.....	.....	19,042,000	2 63,832	335.2	163.5
1857.....	1,171,000	5,363	458.0	252.0	.....	.....	.....	.....	.....	19,257,000	2 65,762	341.5	156.6
1858.....	1,191,000	5,477	459.9	263.6	.....	.....	.....	.....	.....	19,471,000	65,137	334.5	144.9
1859.....	1,211,000	5,497	453.9	262.1	.....	.....	.....	.....	.....	19,687,000	64,503	329.7	147.2
1860.....	1,231,000	5,519	448.3	239.2	31,443,321	.....	* 55,199	175.6	140.6	19,903,000	65,256	327.9	154.4
1861.....	1,238,000	5,519	445.8	229.1	.....	.....	.....	.....	.....	20,119,000	68,285	339.4	156.9
1862.....	1,245,000	5,096	409.3	221.8	.....	.....	.....	.....	.....	20,371,000	66,163	324.8	151.6
1863.....	1,253,000	5,554	443.3	200.1	.....	.....	.....	.....	.....	20,626,000	67,299	326.3	142.0
1864.....	1,260,000	5,606	444.9	195.2	.....	.....	.....	.....	.....	20,884,000	69,293	331.8	139.8
1865.....	1,267,000	5,464	431.3	208.9	.....	.....	.....	.....	.....	21,145,000	70,642	334.1	143.9
1866.....	1,303,000	5,330	409.1	225.5	.....	.....	.....	.....	.....	21,410,000	72,049	336.5	143.9
1867.....	1,340,000	5,083	379.3	223.2	.....	.....	.....	.....	.....	21,678,000	71,562	330.1	151.9
1868.....	1,378,000	5,157	374.2	201.4	.....	.....	.....	.....	.....	21,949,000	67,919	309.4	141.3
1869.....	1,417,000	5,396	380.8	207.1	38,558,371	.....	* 77,355	200.6	160.1	22,223,000	68,835	309.7	139.1
1870.....	1,457,000	5,879	403.5	215.1	.....	.....	.....	.....	.....	22,501,000	70,925	315.2	137.6

¹ As stated to nearest thousand in international statistics compiled by the French Government (*Statistique générale de la France; 1907*), from which are taken all of the data given in this table except those for the United States, England and Wales from 1849 to 1857, and all figures for the years 1906 and 1907.

² Figures from Annual Reports of Registrar-General include scrofula, tabes mesenterica, phthisis, and hydrocephalus.

* Figures are for census years, and include consumption, scrofula, tabes ("marasmus" in 1850), hydrocephalus, and general tuberculosis (1900).

TABLE 1.—Death rates and proportional deaths (to all causes) from all forms of tuberculosis in the United States, Massachusetts, and England and Wales, for each year since the middle of the last century—Continued.

YEAR OR TEN-YEAR PERIOD.	MASSACHUSETTS.				UNITED STATES. (Registration area beginning in 1880.)				ENGLAND AND WALES.			
	Midyear population. ¹	Number of deaths from tuberculosis (all forms).	Death rate for tuberculosis (all forms) per 100,000 of population.	Deaths from tuberculosis (all forms) per 1,000 of total deaths.	Population on June 1.	Per cent in registration area.	Number of deaths from tuberculosis (all forms).	Death rate for tuberculosis (all forms) per 100,000 of population.	Deaths from tuberculosis (all forms) per 1,000 of total deaths.	Midyear population. ¹	Number of deaths from tuberculosis (all forms).	Death rate for tuberculosis (all forms) per 100,000 of population.	Deaths from tuberculosis (all forms) per 1,000 of total deaths.
1871.....	1,494,000	5,959	398.9	213.3	.....	.....	.....	.....	22,789,000	69,642	305.6	135.3
1872.....	1,532,000	6,593	430.4	188.3	.....	.....	.....	.....	23,066,000	68,845	298.1	139.9
1873.....	1,571,000	6,660	423.9	196.4	.....	.....	.....	.....	23,409,000	67,851	289.9	137.8
1874.....	1,611,000	6,405	397.6	200.9	.....	.....	.....	.....	23,725,000	65,975	278.1	125.3
1875.....	1,652,000	6,874	416.1	196.5	.....	.....	.....	.....	24,045,000	71,985	299.4	131.7
1876.....	1,677,000	6,379	380.4	192.2	.....	.....	.....	.....	24,370,000	69,811	286.5	136.8
1877.....	1,703,000	6,381	374.7	203.6	.....	.....	.....	.....	24,700,000	70,203	284.2	142.6
1878.....	1,729,000	6,322	365.6	202.0	.....	.....	.....	.....	25,033,000	73,177	292.3	135.5
1879.....	1,756,000	6,297	358.6	198.0	.....	.....	.....	.....	25,371,000	70,060	276.1	133.1
1880.....	1,783,000	6,755	378.9	191.4	8,538,366	17.0	27,850	326.2	25,714,000	69,628	270.8	131.7
1881.....	1,814,000	7,191	396.4	197.2	.....	.....	.....	.....	26,046,000	65,904	253.0	134.0
1882.....	1,845,000	7,153	387.7	194.5	.....	.....	.....	.....	26,335,000	67,960	258.1	131.5
1883.....	1,877,000	7,237	385.6	191.7	.....	.....	.....	.....	26,627,000	68,990	259.1	131.9
1884.....	1,909,000	7,121	373.0	192.5	.....	.....	.....	.....	26,922,000	69,408	257.8	130.8
1885.....	1,942,000	7,323	377.1	192.2	.....	.....	.....	.....	27,221,000	66,158	243.0	126.6
1886.....	1,998,000	7,329	366.8	196.8	.....	.....	.....	.....	27,523,000	68,075	247.3	126.7
1887.....	2,056,000	7,439	361.8	182.5	.....	.....	.....	.....	27,828,000	63,521	228.3	119.7
1888.....	2,115,000	7,408	350.3	176.0	.....	.....	.....	.....	28,136,000	62,682	222.8	122.7
1889.....	2,176,000	7,222	331.9	172.9	.....	.....	.....	.....	28,448,000	64,235	225.8	123.9
1890.....	2,239,000	7,332	327.5	168.4	19,659,440	31.4	52,578	267.4	28,764,000	68,330	237.6	121.5
1891.....	2,289,000	7,152	312.5	158.3	.....	.....	.....	.....	29,086,000	66,907	230.0	113.8
1892.....	2,340,000	7,395	316.0	151.7	.....	.....	.....	.....	29,421,000	63,015	214.2	112.6
1893.....	2,392,000	7,335	306.6	149.4	.....	.....	.....	.....	29,761,000	63,742	214.2	111.8
1894.....	2,446,000	7,236	295.8	154.6	.....	.....	.....	.....	30,104,000	59,301	197.0	118.9
1895.....	2,500,000	7,296	291.8	153.5	.....	.....	.....	.....	30,452,000	62,709	205.9	110.2
1896.....	2,558,000	7,327	286.4	148.4	.....	.....	.....	.....	30,803,000	58,291	189.2	110.7
1897.....	2,618,000	7,117	271.8	150.1	.....	.....	.....	.....	31,158,000	59,941	192.4	110.7
1898.....	2,679,000	6,999	261.3	149.7	.....	.....	.....	.....	31,518,000	60,139	190.8	108.9
1899.....	2,741,000	6,934	253.0	145.3	.....	.....	.....	.....	31,881,000	60,659	190.3	104.3
1900.....	2,805,000	7,067	251.9	138.1	30,765,618	40.5	61,888	201.2	32,249,000	61,302	190.1	104.3

1901	2,844,000	6,670	234.5	138.2	31,292,130	40.5	61,599	196.9	118.9	32,621,000	58,865	180.5	106.7
1902	2,883,000	6,370	221.0	134.1	31,908,655	40.6	58,938	184.7	115.9	32,998,000	57,324	173.7	107.0
1903	2,923,000	6,130	209.7	125.0	32,536,989	40.7	61,487	189.0	117.2	33,378,000	58,045	173.9	112.8
1904	2,963,000	6,453	217.8	133.1	33,135,453	40.8	66,797	201.6	121.2	33,763,000	60,139	178.1	109.4
1905	3,004,000	6,457	214.9	127.9	33,757,811	40.9	65,352	193.6	119.8	34,153,000	55,679	163.0	107.1
1906	3,045,000	6,482	212.9	128.0	40,996,317	48.8	75,512	184.2	114.7	34,547,000	56,841	164.5	107.0
1907					41,758,037	48.8	76,650	183.6	111.6				
1851-1860	1,133,000	5,324	469.9	257.5						18,639,000	66,041	348.7	156.8
1861-1870	1,316,000	5,408	410.9	212.0						21,190,000	69,297	327.0	144.5
1871-1880	1,651,000	6,463	391.5	197.9						24,225,000	69,718	287.8	134.6
1881-1890	1,997,000	7,276	364.3	185.9						27,385,000	66,526	242.9	126.8
1891-1900	2,537,000	7,186	283.2	149.8						30,666,000	61,601	200.9	110.5
1901-1906 ⁴	2,944,000	6,427	218.3	131.0	33,937,893	42.1	64,948	191.4	117.9	33,577,000	57,816	172.2	108.3

¹As stated to the nearest thousand in international statistics compiled by the French Government (*Statistique générale de la France, 1907*), from which are taken all of the data given in this table except those for the United States, England and Wales from 1849 to 1857, and all figures for the years 1906 and 1907.

²Figures are for census years, and include consumption, scrofula, tabes ("marasmus" in 1850), hydrocephalus, and general tuberculosis (1900).

³This represents the first of the annual reports on Vital Statistics of the United States and relates to the calendar year. The figures for the census year 1900 are: Population, 28,807,299, or 37.9 per cent of the total population of the country; deaths from tuberculosis (all forms), 59,111, corresponding to a death rate of 205.2 per 100,000 of population, and a ratio of 115.3 per 1,000 of deaths.

⁴Six-year period.

TABLE 2.—Death rates from tuberculosis of lungs in the registration area of the United States and in certain foreign countries (during recent years): 1902 to 1906.

COUNTRY.	NUMBER OF DEATHS FROM TUBERCULOSIS OF LUNGS PER 100,000 OF POPULATION.					
	Annual average: 1901 to 1905.	1902	1903	1904	1905	1906
United States (registration area).....	169.9	163.2	165.7	177.3	168.2	159.4
Australasia.....	85.6	89.1	86.8	85.9	76.5	75.7
5— Australian Commonwealth.....	88.9	91.5	90.4	89.2	80.8	78.7
New South Wales.....	80.2	80.6	86.8	81.2	70.1	66.5
Queensland.....	81.3	89.2	78.4	79.0	75.5	67.8
South Australia.....	80.4	81.1	81.8	79.0	75.2	81.6
Tasmania.....	63.3	58.0	63.1	63.2	74.8	65.9
Victoria.....	111.6	116.6	110.9	111.1	101.9	98.9
Western Australia.....	72.6	71.0	65.1	83.7	64.7	82.0
16— New Zealand.....	69.9	77.3	69.5	70.8	57.0	62.1
1— Austria.....	334.8	337.4	336.2	331.4	(1)	(1)
13— Belgium.....	118.2	131.6	108.6	109.1	107.5	(1)
Ceylon.....	93.0	90.8	91.3	92.6	95.7	104.6
Chile.....	(2)	(1)	245.1	(1)	201.7	(1)
German Empire.....	185.8	187.7	187.3	182.6	179.3	(1)
Italy ³	114.9	108.8	111.6	117.4	118.2	148.8
14— Jamaica.....	153.7	147.7	155.2	163.0	152.2	160.4
Japan.....	146.3	143.4	144.9	⁴ 146.4	⁴ 159.5	(1)
11— Netherlands.....	133.4	132.0	132.0	129.4	135.7	133.7
Norway.....	196.4	188.5	198.2	197.4	203.5	(1)
Servia.....	279.7	265.6	277.5	277.0	332.5	287.4
Spain.....	147.8	186.0	144.0	⁴ 150.9	⁴ 141.1	⁴ 144.4
Switzerland.....	188.6	187.0	188.0	188.2	191.9	(1)
United Kingdom.....	133.8	135.0	132.9	136.5	126.2	(1)
England and Wales.....	121.5	123.3	120.3	124.0	114.0	115.0
Scotland.....	144.5	145.0	144.8	145.6	136.3	(1)
Ireland.....	215.3	212.0	216.6	223.4	209.9	203.6

¹ No figures available; average only for years shown.

² Annual average not shown for less than three years.

³ Includes general tuberculosis.

⁴ Rates based on provisional figures.

TABLE 3.—Deaths, death rates, and per cent of deaths from the various forms of tuberculosis (International Classification) in the registration area of the United States (during recent years): 1902 to 1907.

FORM OF DISEASE.	Annual average: 1901 to 1905.	NUMBER OF DEATHS FROM VARIOUS FORMS OF TUBERCULOSIS.					1907
		1902	1903	1904	1905	1906	
Tuberculosis (all forms).....	62,835	58,938	61,487	66,797	65,352	75,512	76,650
Tuberculosis of lungs.....	55,251	52,079	53,910	58,763	56,770	65,341	66,374
Tuberculosis of larynx.....	557	541	539	570	610	645	690
Tuberculous meningitis.....	2,905	2,674	2,905	3,025	3,264	3,938	4,062
Abdominal tuberculosis.....	1,946	1,817	1,854	2,098	2,193	2,663	2,629
Pott's disease.....	492	421	516	519	563	618	594
Tuberculous abscess.....	56	39	72	62	61	49	65
White swelling.....	234	237	224	241	261	315	269
Tuberculosis of other organs.....	467	391	465	545	539	685	713
General tuberculosis.....	926	739	1,002	974	1,091	1,258	1,254
DEATH RATE PER 100,000 OF POPULATION.							
Tuberculosis (all forms).....	193.2	184.7	189.0	201.6	193.6	184.2	183.6
Tuberculosis of lungs.....	169.9	163.2	165.7	177.3	168.2	159.4	158.9
Tuberculosis of larynx.....	1.7	1.7	1.7	1.7	1.8	1.6	1.7
Tuberculous meningitis.....	8.9	8.4	8.9	9.1	9.7	9.6	9.7
Abdominal tuberculosis.....	6.0	5.7	5.7	6.3	6.5	6.5	6.3
Pott's disease.....	1.5	1.3	1.6	1.6	1.7	1.5	1.4
Tuberculous abscess.....	0.2	0.1	0.2	0.2	0.2	0.1	0.2
White swelling.....	0.7	0.7	0.7	0.7	0.8	0.8	0.6
Tuberculosis of other organs.....	1.4	1.2	1.4	1.6	1.6	1.7	1.7
General tuberculosis.....	2.8	2.3	3.1	2.9	3.2	3.1	3.0

TABLE 3.—Deaths, death rates, and per cent of deaths from the various forms of tuberculosis (International Classification) in the registration area of the United States (during recent years): 1902 to 1907—Continued.

FORM OF DISEASE.	Annual average: 1901 to 1905.	1902	1903	1904	1905	1906	1907
		PER CENT OF TOTAL DEATHS FROM ALL FORMS OF TUBERCULOSIS.					
Tuberculosis (all forms).....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Tuberculosis of lungs.....	87.9	88.4	87.7	88.0	86.9	86.5	86.6
Tuberculosis of larynx.....	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Tuberculous meningitis.....	4.6	4.5	4.7	4.5	5.0	5.2	5.3
Abdominal tuberculosis.....	3.1	3.1	3.0	3.1	3.4	3.5	3.4
Pott's disease.....	0.8	0.7	0.8	0.8	0.9	0.8	0.8
Tuberculous abscess.....	0.1	0.1	0.1	0.1	0.1	0.1	0.1
White swelling.....	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Tuberculosis of other organs.....	0.7	0.7	0.8	0.8	0.8	0.9	0.9
General tuberculosis.....	1.5	1.3	1.6	1.5	1.7	1.7	1.6

TABLE 4.—Death rates, by sex, and as urban and rural, from tuberculosis of lungs¹ for the registration states: 1900 and 1890.

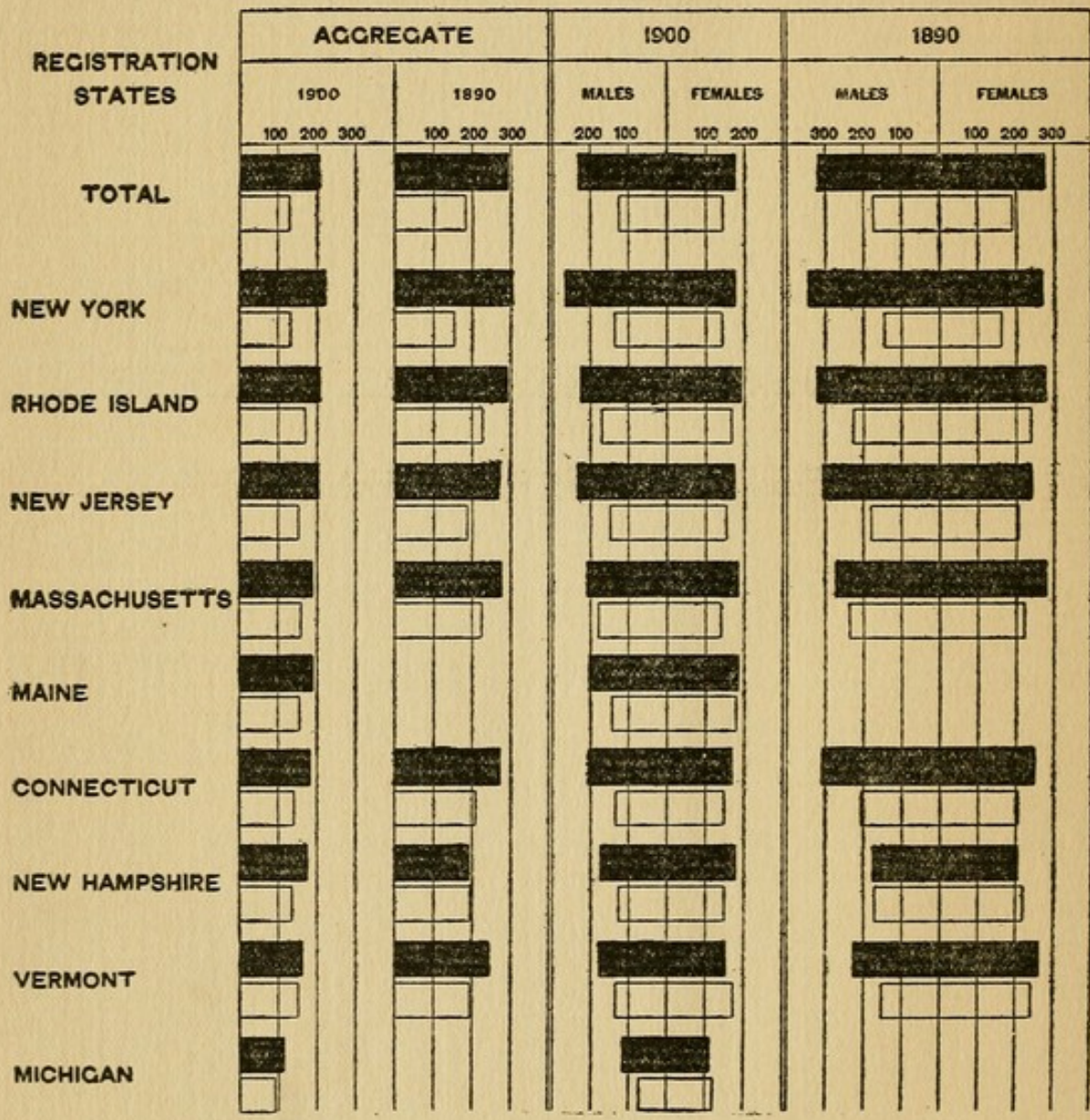
REGISTRATION STATE.	NUMBER OF DEATHS FROM TUBERCULOSIS OF LUNGS PER 100,000 OF POPULATION.								
	Aggregate.			Males.			Females.		
	Total.	Cities.	Rural.	Total.	Cities.	Rural.	Total.	Cities.	Rural.
Total, 1900.....	175.9	204.8	134.1	188.4	234.3	124.9	163.3	176.4	143.8
1890.....	249.0	293.5	181.0	257.7	318.0	168.6	240.4	270.1	193.6
Connecticut, 1900.....	168.3	182.7	141.8	176.8	200.2	134.3	159.8	165.4	149.6
1890.....	233.6	272.6	205.8	245.7	301.4	206.7	221.7	244.9	204.9
District of Columbia, 1900.....	305.3	305.3	.....	334.1	334.1	.....	279.4	279.4	.....
1890.....	359.0	359.0	.....	403.3	403.3	.....	318.7	318.7	.....
Maine, ² 1900.....	164.9	191.7	159.4	149.3	200.1	139.6	180.8	184.0	180.1
Massachusetts, 1900.....	186.2	193.7	162.5	202.5	208.1	185.3	170.7	180.2	140.0
1890.....	267.1	279.4	227.0	265.2	276.1	230.4	268.9	282.4	223.8
Michigan, ² 1900.....	100.7	116.7	94.1	84.8	119.6	71.2	117.6	113.8	119.4
New Hampshire, 1900.....	152.3	176.2	137.3	142.2	173.0	124.0	162.5	179.1	151.3
1890.....	193.6	191.9	194.3	171.5	176.5	169.6	215.3	205.6	219.6
New Jersey, 1900.....	180.1	202.2	151.1	194.3	232.0	145.6	165.8	172.7	156.7
1890.....	234.5	268.9	189.4	247.1	300.3	178.7	221.9	238.2	200.3
New York, 1900.....	194.1	221.4	137.3	221.3	265.3	132.4	167.2	178.8	142.4
1890.....	247.7	306.6	152.3	264.3	343.2	141.2	231.2	271.5	163.8
Rhode Island, 1900.....	195.3	208.3	170.0	207.1	225.5	172.5	183.9	192.1	167.4
1890.....	266.6	294.9	227.6	275.6	320.2	216.2	258.1	271.6	238.8
Vermont, 1900.....	152.5	160.9	151.2	137.0	168.6	132.4	168.5	153.7	171.0
1890.....	198.8	243.9	194.7	155.3	221.5	149.6	244.0	264.4	242.0

¹ Identical with *consumption* as shown in the diagram; the latter term was employed in the Mortality Statistics of the Census up to the close of the census year 1899-1900.

² Nonregistration in 1890.

CONSUMPTION

NUMBER OF DEATHS PER 100,000 OF POPULATION
FOR CITIES AND RURAL DISTRICTS
IN THE REGISTRATION STATES: 1900 AND 1890



CITIES RURAL

TABLE 5.—Death rates, by sex, for the registration area and registration states (aggregate, urban, and rural) from tuberculosis of lungs: 1900 and 1890.

AREA.	NUMBER OF DEATHS FROM TUBERCULOSIS OF LUNGS PER 100,000 OF POPULATION.					
	15 to 44 years.		45 to 64 years.		65 years and over.	
	1900	1890	1900	1890	1900	1890
Registration area.....	252.4	320.1	232.5	319.3	260.1	369.0
Males.....	265.3	324.5	290.7	384.5	293.9	410.0
Females.....	239.5	315.7	173.1	254.8	230.0	332.3
Registration states.....	239.8	324.8	208.4	310.2	246.6	360.5
Males.....	251.5	327.0	253.1	372.1	269.0	381.1
Females.....	228.2	322.7	163.6	250.5	226.2	341.9
Cities.....	276.8	380.7	257.9	389.1	264.2	401.3
Males.....	311.2	404.5	337.2	487.1	333.5	458.8
Females.....	243.9	358.2	181.8	296.5	210.3	356.2
Rural.....	179.1	227.4	151.4	212.3	233.6	330.7
Males.....	158.1	197.1	160.6	232.5	228.0	331.3
Females.....	201.1	258.2	141.6	192.4	239.4	330.2

TABLE 6.—Proportional deaths from each form of tuberculosis (International Classification) at certain age periods for the registration area: 1900 to 1904.

AGE.	PROPORTION OF DEATHS IN EACH AGE PERIOD PER 1,000 AT KNOWN AGE.									
	Tuber- culosis (all forms).	Tuber- culosis of lungs.	Tuber- culosis of larynx.	Tuber- culosis menin- gitis.	Ab- domi- nal tuber- culosis.	Pott's dis- ease.	Tuber- culous ab- scess.	White swell- ing.	Tuber- culosis of other organs.	Gen- eral tuber- culosis.
All ages.....	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Under 1 year.....	30.1	14.3	10.5	277.3	103.7	53.2	76.9	24.3	43.8	73.8
Under 5 years.....	68.8	31.6	20.6	673.8	195.6	151.8	123.1	100.7	101.3	171.9
5 to 14 years.....	35.8	24.9	12.4	158.0	82.7	208.9	65.4	264.4	71.6	86.2
15 to 24 years.....	204.1	213.8	129.3	62.3	173.1	161.3	153.8	205.0	147.9	206.4
25 to 34 years.....	267.2	284.9	270.6	47.1	168.0	144.5	192.3	125.0	188.4	199.9
35 to 44 years.....	189.9	201.4	242.6	30.9	133.5	111.2	123.1	97.1	153.1	145.4
45 to 64 years.....	179.2	187.2	245.3	22.0	175.3	157.4	242.3	136.7	223.2	143.5
65 years and over..	55.0	56.2	79.2	5.9	71.8	64.9	100.0	71.1	114.5	46.7

TABLE 7.—Relative importance of tuberculosis as a cause of death at specified age periods in the registration area: 1907.

(A) AT ALL AGES.

CAUSE OF DEATH.	PER CENT OF DEATHS AT ALL AGES.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Typhoid fever.....	1.8	2.1	1.6
Whooping cough.....	0.7	0.6	0.8
Diphtheria and croup.....	1.5	1.4	1.6
Tuberculosis (all forms).....	11.2	11.4	10.9
Tuberculosis of lungs.....	9.7	9.9	9.4
Cancer.....	4.4	3.1	6.0
Meningitis.....	1.6	1.7	1.5
Apoplexy.....	4.6	4.3	4.9
Paralysis.....	1.2	1.1	1.3
"Convulsions".....	1.0	1.1	1.0
Heart disease.....	8.6	8.4	8.8
Bronchitis.....	1.9	1.7	2.1
Pneumonia (all forms).....	9.8	9.9	9.7
Diarrhea and enteritis.....	7.1	6.9	7.3
Cirrhosis of liver.....	1.0	1.2	0.7
Nephritis and Bright's disease.....	6.4	6.6	6.2
Premature birth.....	2.2	2.3	2.1
Congenital debility.....	2.2	2.3	2.2
Old age.....	2.0	1.6	2.5
Violence.....	7.6	10.9	3.8
Ill-defined causes.....	2.1	2.0	2.2
All other causes.....	21.0	19.5	22.8

(B) UNDER 15 YEARS OF AGE.

CAUSE OF DEATH.	PER CENT OF DEATHS UNDER 15 YEARS.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Typhoid fever.....	1.0	0.9	1.1
Measles.....	1.9	1.8	2.0
Scarlet fever.....	1.9	1.7	2.1
Whooping cough.....	2.3	2.0	2.7
Diphtheria and croup.....	4.5	4.4	4.7
Tuberculosis (all forms).....	4.0	3.6	4.4
Tuberculosis of lungs.....	1.7	1.4	2.1
Tuberculous meningitis.....	1.6	1.5	1.6
Meningitis.....	3.8	3.8	3.9
"Convulsions".....	3.3	3.4	3.1
Heart disease.....	1.1	1.1	1.2
Bronchitis.....	3.0	2.9	3.0
Pneumonia (all forms).....	13.1	12.9	13.2
Diarrhea and enteritis.....	21.0	20.9	21.0
Congenital malformation of heart (cyanosis).....	1.9	2.0	1.8
Premature birth.....	7.3	7.5	7.0
Congenital debility.....	7.3	7.6	7.0
Violence.....	5.2	5.9	4.3
Ill-defined causes.....	4.2	4.1	4.3
All other causes.....	13.4	13.5	13.3

TABLE 7.—Relative importance of tuberculosis as a cause of death at specified age periods in the registration area: 1907—Continued.

(C) FROM 15 TO 29 YEARS, INCLUSIVE.

CAUSE OF DEATH.	PER CENT OF DEATHS FROM 15 TO 29 YEARS, INCLUSIVE.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Typhoid fever.....	7.4	8.6	5.9
Tuberculosis (all forms).....	33.2	29.0	38.3
Tuberculosis of lungs.....	30.5	26.5	35.3
Abdominal tuberculosis.....	0.9	0.7	1.2
Cancer.....	0.9	0.7	1.1
Meningitis.....	2.0	2.5	1.4
Heart disease.....	4.3	4.0	4.7
Pneumonia (all forms).....	6.7	7.8	5.4
Peritonitis.....	1.1	0.6	1.7
Appendicitis.....	2.2	2.5	1.9
Nephritis and Bright's disease.....	3.9	3.4	4.6
Puerperal septicemia.....	2.2	.....	4.8
Puerperal convulsions.....	1.1	.....	2.5
Other causes incident to childbirth.....	1.4	.....	3.0
Violence.....	16.8	26.1	5.6
All other causes.....	16.7	14.9	19.0

(D) FROM 30 TO 44 YEARS, INCLUSIVE.

CAUSE OF DEATH.	PER CENT OF DEATHS FROM 30 TO 44 YEARS, INCLUSIVE.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Typhoid fever.....	3.3	3.7	2.7
Tuberculosis (all forms).....	25.6	26.2	24.8
Tuberculosis of lungs.....	23.8	24.5	22.8
Cancer.....	4.5	2.3	7.7
Alcoholism.....	1.5	2.2	0.4
Apoplexy.....	2.2	2.1	2.3
General paralysis of insane.....	0.8	1.1	0.4
Endocarditis.....	1.0	0.9	1.0
Heart disease.....	7.1	6.4	8.1
Pneumonia (all forms).....	8.8	9.9	7.2
Cirrhosis of liver.....	1.5	1.8	1.2
Peritonitis.....	0.8	0.4	1.4
Appendicitis.....	1.1	1.2	1.0
Nephritis and Bright's disease.....	7.5	6.9	8.3
Puerperal septicemia.....	1.3	.....	3.2
Puerperal convulsions.....	0.6	.....	1.5
Other causes incident to childbirth.....	1.3	.....	3.2
Violence.....	13.1	19.6	4.1
Ill-defined causes.....	0.8	0.7	0.9
All other causes.....	17.1	14.7	20.6

TABLE 7.—*Relative importance of tuberculosis as a cause of death at specified age periods in the registration area: 1907—Continued.*

(E) FROM 45 TO 59 YEARS, INCLUSIVE.

CAUSE OF DEATH.	PER CENT OF DEATHS FROM 45 TO 59 YEARS, INCLUSIVE.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Typhoid fever.....	1.3	1.4	1.1
Tuberculosis (all forms).....	12.1	13.9	9.6
Tuberculosis of lungs.....	11.0	12.8	8.5
Cancer.....	10.5	6.5	16.2
Diabetes.....	1.6	1.2	2.0
Alcoholism.....	1.0	1.6	0.3
Apoplexy.....	6.5	5.8	7.5
Paralysis.....	1.2	1.0	1.6
General paralysis of insane.....	0.8	1.0	0.4
Endocarditis.....	1.4	1.4	1.4
Heart disease.....	12.5	12.0	13.2
Pneumonia (all forms).....	8.9	9.4	8.2
Diarrhea and enteritis.....	0.8	0.7	1.0
Cirrhosis of liver.....	2.4	2.9	1.7
Nephritis and Bright's disease.....	11.0	10.9	11.1
Violence.....	8.5	12.3	3.0
Ill-defined causes.....	1.1	1.0	1.2
All other causes.....	18.4	16.9	20.4

(F) FROM 60 TO 74 YEARS, INCLUSIVE.

CAUSE OF DEATH.	PER CENT OF DEATHS FROM 60 TO 74 YEARS, INCLUSIVE.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Influenza.....	2.3	1.8	3.0
Tuberculosis (all forms).....	4.6	5.0	4.1
Tuberculosis of lungs.....	4.1	4.5	3.7
Cancer.....	9.0	7.2	11.0
Diabetes.....	1.8	1.5	2.2
Apoplexy.....	10.5	10.3	10.7
Paralysis.....	2.6	2.5	2.8
Endocarditis.....	1.3	1.3	1.4
Heart disease.....	17.4	17.8	16.9
Angina pectoris.....	1.0	1.2	0.9
Diseases of arteries.....	2.1	2.5	1.7
Bronchitis.....	2.0	1.6	2.4
Pneumonia (all forms).....	8.7	8.2	9.4
Gastritis.....	0.7	0.6	0.9
Diarrhea and enteritis.....	1.3	1.1	1.5
Cirrhosis of liver.....	1.6	1.9	1.2
Nephritis and Bright's disease.....	11.5	12.5	10.3
Other diseases of genito-urinary system.....	1.5	2.2	0.7
Old age.....	1.9	1.6	2.2
Violence.....	4.0	5.4	2.3
Ill-defined causes.....	1.5	1.5	1.4
All other causes.....	12.7	12.5	13.0

TABLE 7.—Relative importance of tuberculosis as a cause of death at specified age periods in the registration area: 1907—Continued.

(G) OVER 75 YEARS OF AGE.

CAUSE OF DEATH.	PER CENT OF DEATHS AT 75 YEARS AND OVER.		
	Total.	Males.	Females.
All causes.....	100.0	100.0	100.0
Influenza.....	4.0	3.5	4.5
Dysentery.....	0.7	0.6	0.8
Tuberculosis (all forms).....	1.4	1.5	1.4
Tuberculosis of lungs.....	1.3	1.3	1.2
Cancer.....	4.4	3.9	4.9
Apoplexy.....	10.4	10.3	10.5
Paralysis.....	3.5	3.4	3.6
Endocarditis.....	1.1	1.1	1.2
Heart disease.....	15.4	16.4	14.5
Diseases of arteries.....	3.5	3.9	3.1
Bronchitis.....	3.6	2.9	4.2
Pneumonia (all forms).....	8.2	7.1	9.2
Gastritis.....	1.0	0.8	1.1
Diarrhea and enteritis.....	1.8	1.5	2.0
Nephritis and Bright's disease.....	8.2	9.6	6.8
Diseases of bladder.....	0.9	1.6	0.2
Other diseases of genito-urinary system.....	1.1	2.0	0.3
Gangrene.....	1.0	1.2	0.8
Old age.....	13.6	12.3	14.8
Violence.....	3.4	3.4	3.4
Ill-defined causes.....	1.9	2.1	1.8
All other causes.....	10.8	10.9	10.7

TABLE 8.—Relative importance of tuberculosis as a cause of death in the registration states: 1907.

CAUSE OF DEATH.	California.	Colorado.	Connecticut.	Indiana.	Maine.	Maryland.	Massachusetts.	Michigan.	New Hampshire.	New Jersey.	New York.	Pennsylvania.	Rhode Island.	South Dakota.	Vermont.
All causes.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Typhoid fever.....	1.8	3.6	1.2	2.8	1.1	2.5	0.7	1.6	0.7	1.1	1.2	3.1	0.6	2.0	0.7
Whooping cough.....	0.5	0.4	0.8	0.5	0.6	0.7	0.6	0.6	0.9	0.6	0.5	1.1	0.9	2.9	0.9
Diphtheria and croup.....	1.2	1.2	1.5	1.0	1.0	1.0	1.4	1.1	1.3	1.9	1.7	1.8	1.4	1.7	0.6
Tuberculosis (all forms).....	15.0	16.4	9.8	13.2	10.2	12.4	10.5	7.4	7.6	11.8	11.3	9.3	11.2	10.8	8.1
Cancer.....	5.2	3.1	4.7	4.6	6.1	3.8	5.4	4.8	5.6	3.9	4.5	3.8	5.1	4.0	6.1
Meningitis.....	2.0	1.9	2.0	1.4	2.2	1.4	2.1	1.3	2.2	1.8	1.4	1.1	1.4	1.5	1.1
Apoplexy.....	4.3	2.6	6.2	4.3	6.7	4.0	5.7	4.7	6.7	5.5	4.9	4.6	5.3	2.7	7.5
Paralysis.....	1.2	0.9	0.7	2.1	1.6	2.2	0.9	2.2	1.9	1.2	0.7	1.2	0.7	1.2	0.9
"Convulsions".....	0.4	0.4	0.8	0.6	0.7	1.4	0.8	1.4	0.7	1.1	0.6	1.5	0.4	2.1	0.1
Heart disease.....	10.9	5.7	9.8	9.0	10.5	7.7	10.5	10.9	11.6	7.5	9.2	8.0	9.4	4.9	12.1
Bronchitis.....	1.3	0.9	2.0	1.3	1.6	1.8	2.2	2.1	2.4	1.7	1.9	1.7	2.0	1.0	2.4
Pneumonia (all forms).....	7.9	10.2	9.2	7.5	9.5	8.5	9.2	7.7	7.9	10.9	11.8	9.3	10.0	8.3	10.4
Diarrhea and enteritis.....	3.4	6.0	7.9	6.2	4.1	7.9	7.3	4.9	4.9	8.0	7.6	8.6	8.9	6.9	4.6
Cirrhosis of liver.....	1.3	0.6	1.0	0.8	0.5	0.6	0.6	0.9	0.7	1.1	1.2	0.8	0.9	0.4	0.7
Nephritis and Bright's disease.....	5.6	4.8	6.0	5.6	6.1	7.5	5.2	4.6	5.6	7.1	7.9	5.6	8.0	3.7	6.0
Premature birth.....	1.5	2.2	2.5	2.5	1.8	2.4	2.5	2.0	2.7	2.1	2.2	2.2	2.2	1.4	2.7
Congenital deafity.....	1.4	1.6	2.2	2.1	2.0	3.6	2.7	2.6	2.6	2.2	1.9	2.3	1.6	3.1	0.9
Old age.....	1.9	1.9	1.7	2.5	4.4	2.5	2.1	3.6	4.1	1.4	1.5	1.4	1.8	4.3	3.7
Violence.....	10.8	10.5	7.2	7.1	5.3	5.8	6.1	7.5	5.2	7.3	6.9	9.4	6.8	8.9	5.4
Ill-defined causes.....	1.7	1.2	1.5	1.6	3.6	4.1	2.2	3.1	2.7	2.4	1.0	2.6	1.3	6.8	1.8
All other causes.....	20.7	23.6	21.4	23.6	20.5	18.2	21.0	24.9	22.0	19.4	19.9	20.2	20.2	21.3	23.2

NOTE.—This table is based upon the returns of the deaths that actually occurred in the several states, including deaths of nonresidents. Many of the deaths from tuberculosis reported from certain states were those of invalids whose illness originated elsewhere.

TABLE 9.—Death rates from tuberculosis of lungs,¹ of white and colored, by sex, for the registration area and registration states (aggregate, urban, and rural): 1900 and 1890.

AREA.		NUMBER OF DEATHS FROM TUBERCULOSIS OF LUNGS PER 100,000 OF POPULATION.					
		White.			Colored.		
		Total.	Males.	Females.	Total.	Males.	Females.
Registration area.....	1900..	173.5	188.3	158.8	490.6	527.3	455.1
	1890..	230.0	240.1	220.0	546.1	578.3	515.0
Registration states.....	1900..	170.5	182.8	158.3	431.9	463.2	401.6
	1890..	242.4	250.1	234.9	529.2	589.8	471.9
Cities.....	1900..	197.8	226.8	169.9	471.0	525.8	420.2
	1890..	285.1	308.1	263.2	600.1	696.7	513.7
Rural.....	1900..	131.6	122.4	141.2	322.7	302.2	345.2
	1890..	177.7	165.1	190.6	365.2	364.4	366.1

¹ Identical with *consumption* as shown in the diagram; the latter term was employed in the Mortality Statistics of the Census up to the close of the census year 1899-1900.

TABLE 10.—Death rates from tuberculosis of lungs,¹ by conjugal condition, at certain age periods in the registration area: 1900.

CONJUGAL CONDI- TION.	NUMBER OF DEATHS FROM TUBERCULOSIS OF LUNGS (IN THE REGISTRATION AREA) PER 100,000 OF POPULATION.							
	15 years and over.		15 to 44 years.		45 to 64 years.		65 years and over.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Single.....	309.8	225.2	292.2	223.4	565.3	235.6	604.1	296.0
Married.....	215.5	216.4	208.3	237.6	223.1	153.7	244.2	236.1
Widowed.....	465.0	235.1	667.0	356.7	487.4	189.3	312.0	213.2

¹ Identical with *consumption* as shown in the diagram; the latter term was employed in the Mortality Statistics of the Census up to the close of the census year 1899-1900.

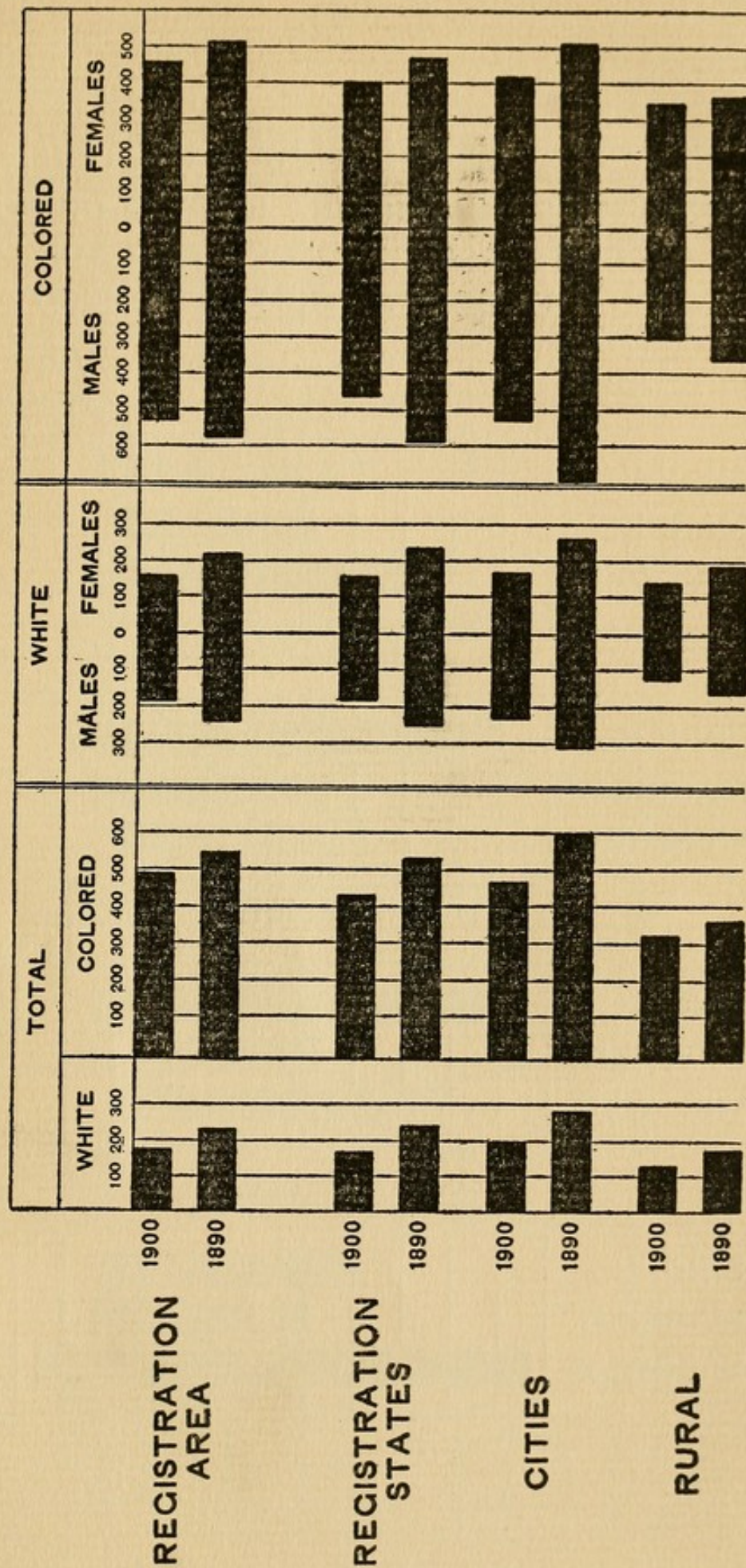
TABLE 11.—Death rates from tuberculosis of lungs¹ and other important causes of death, by classes of occupations, in the registration states: 1900.

PRINCIPAL CAUSE OF DEATH.	NUMBER OF DEATHS PER 100,000 OF POPULATION, OF OCCUPIED MALES, 10 YEARS OF AGE AND OVER (IN THE REGISTRATION STATES), BY CLASS OF OCCUPATION.							
	Profes- sional.	Clerical and official.	Mer- cantile and trad- ing.	Public entertain- ment.	Per- sonal service, police, and milit- ary.	Labor- ing and serv- ant.	Manu- facturing and me- chan- ical in- dustry.	Agri- culture, trans- porta- tion, and other out- door.
Malarial fever.....	6.9	3.8	3.4	3.4	8.7	5.4	4.7	4.5
Typhoid fever.....	37.9	46.6	28.3	27.3	38.2	51.1	29.4	32.8
Rheumatism.....	7.4	7.5	5.5	10.2	6.7	6.6	6.8	9.0
Tuberculosis of lungs.....	182.2	304.2	165.8	268.5	254.8	376.8	262.1	147.2
Diabetes.....	22.2	18.1	19.4	15.9	8.7	7.9	11.2	13.3
Diseases of nervous system.....	263.4	154.0	171.5	192.3	144.8	199.9	172.6	221.3
Heart disease.....	176.8	134.7	145.5	143.4	126.0	192.5	150.0	211.1
Pneumonia.....	143.8	138.7	133.4	166.1	148.2	249.2	138.9	140.0
Diseases of digestive system.....	94.0	94.2	85.9	184.3	76.5	110.2	75.5	91.0
Diseases of urinary system.....	168.4	138.0	140.9	172.9	145.5	167.3	134.6	145.5
Diseases of bones and joints.....	4.9	3.5	2.2	2.3	2.7	6.0	3.2	3.6
Violence.....	77.3	79.8	66.2	88.8	111.3	240.8	108.8	158.6
Cancer.....	51.7	37.7	52.0	35.3	42.9	66.5	53.3	69.2

¹ Identical with *consumption* as shown in the diagram; the latter term was employed in the Mortality Statistics of the Census up to the close of the census year 1899-1900.

CONSUMPTION

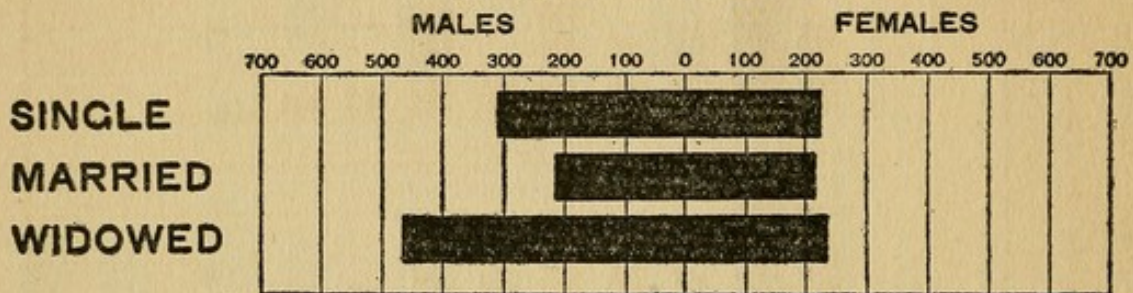
NUMBER OF DEATHS PER 100,000 OF POPULATION
BY COLOR AND SEX: 1900 AND 1890



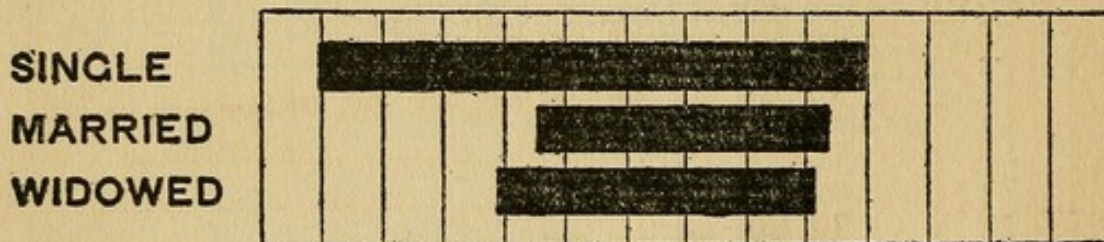
CONSUMPTION

NUMBER OF DEATHS PER 100,000 OF POPULATION
BY CONJUGAL CONDITION AND AGE PERIODS
REGISTRATION AREA: 1900

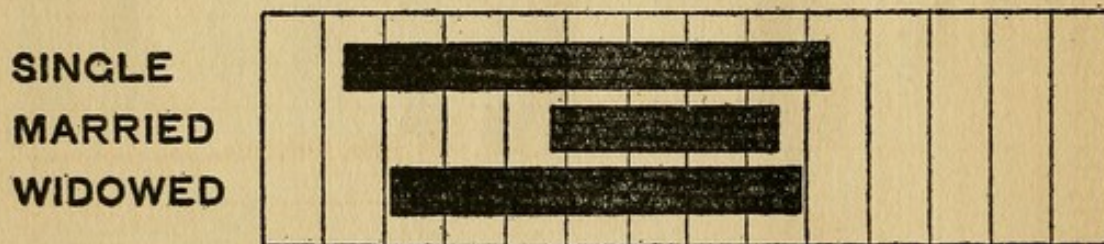
15 YEARS AND OVER



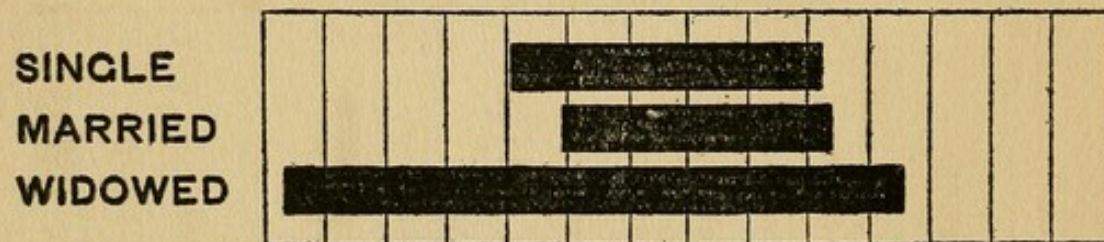
65 YEARS AND OVER



45 TO 64 YEARS



15 TO 44 YEARS



CONSUMPTION

NUMBER OF DEATHS PER 100,000 OF POPULATION
AMONG PERSONS 10 YEARS OF AGE AND UPWARD
IN SPECIFIED OCCUPATIONS: 1900

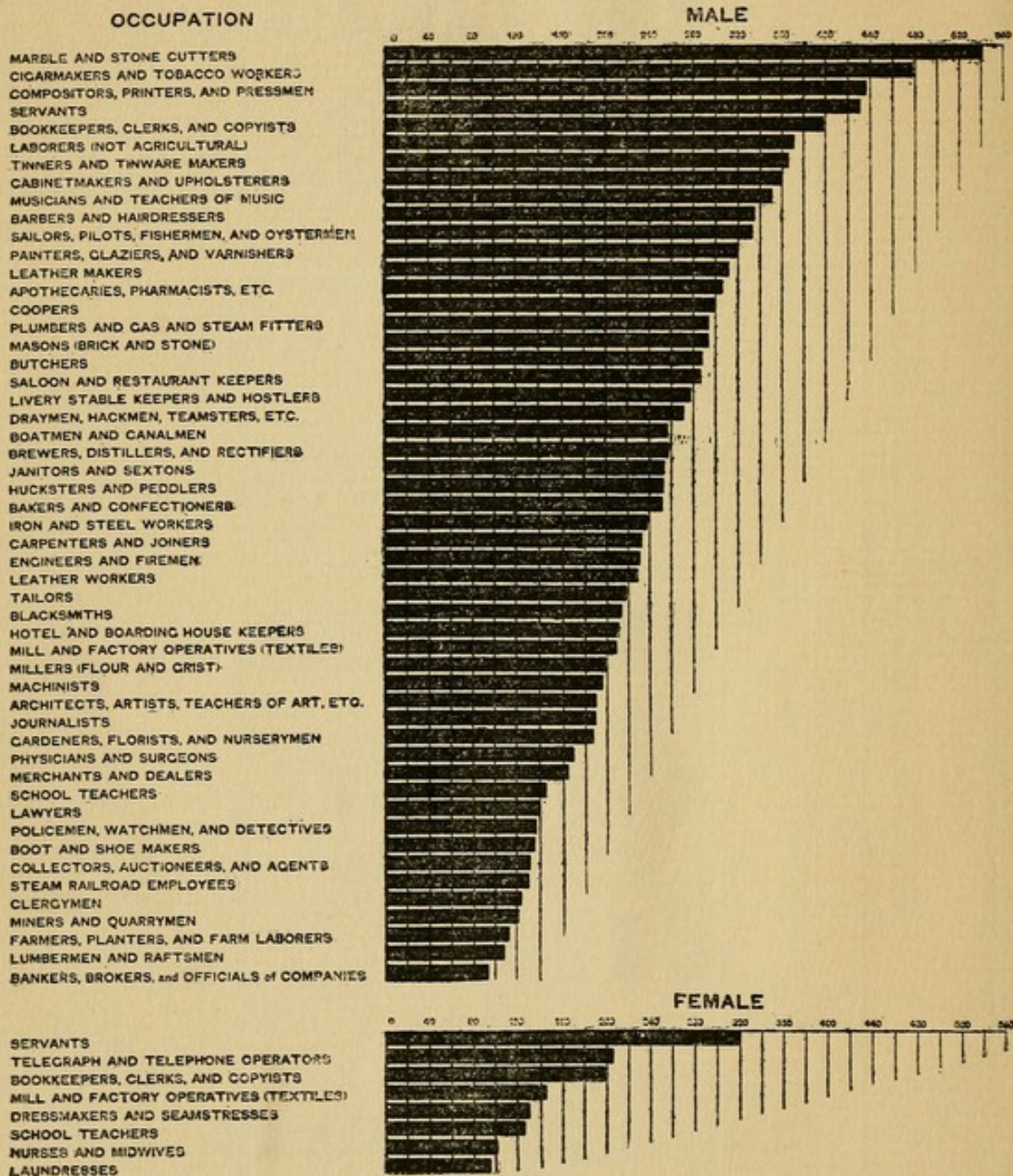


TABLE 12.—Death rates from tuberculosis of lungs¹ for certain occupations of each sex, in the registration states: 1900.

OCCUPATION.	Number of deaths of occupied persons 10 years of age and over, from tuberculosis of lungs per 100,000 of population: 1900.
MALES.	
Marble and stone cutters.....	540.5
Cigarmakers and tobacco workers.....	476.9
Compositors, printers, and pressmen.....	435.9
Servants.....	430.3
Bookkeepers, clerks, and copyists.....	398.0
Laborers (not agricultural).....	370.7
Tinners and tinware makers.....	365.3
Cabinetmakers and upholsterers.....	359.1
Musicians and teachers of music.....	349.8
Barbers and hairdressers.....	334.9
Sailors, pilots, fishermen, and oystermen.....	333.0
Painters, glaziers, and varnishers.....	319.3
Leather makers.....	311.4
Apothecaries, pharmacists, etc.....	305.5
Coopers.....	299.5
Plumbers, and gas and steam fitters.....	294.0
Masons (brick and stone).....	293.9
Butchers.....	287.7
Saloon and restaurant keepers.....	285.6
Livery stable keepers and hostlers.....	267.5
Draymen, hackmen, teamsters, etc.....	261.4
Boatmen and canalmen.....	256.8
Brewers, distillers, and rectifiers.....	256.8
Janitors and sextons.....	251.4
Hucksters and peddlers.....	250.9
Bakers and confectioners.....	250.1
ALL OCCUPIED MALES.....	236.7
Iron and steel workers.....	236.2
Carpenters and joiners.....	231.0
Engineers and firemen (not locomotive).....	229.7
Leather workers.....	227.3
Tailors.....	218.2
Blacksmiths.....	212.9
Hotel and boarding house keepers.....	210.3
Mill and factory operatives(textiles).....	207.6
Millers (flour and grist).....	198.5
Machinists.....	195.9
Architects, artists, teachers of art, etc.....	188.9
Journalists.....	188.4
Gardeners, florists, nurserymen, and vine growers.....	186.6
Physicians and surgeons.....	168.8
Merchants and dealers.....	163.8
School teachers.....	144.0
Lawyers.....	139.9
Policemen, watchmen, and detectives.....	136.7
Boot and shoe makers.....	135.5
Collectors, auctioneers, and agents.....	131.2
Steam railroad employees.....	129.8
Clergymen.....	123.5
Miners and quarrymen.....	120.9
Farmers, planters, and farm laborers.....	111.7
Lumbermen and raftsmen.....	107.1
Bankers, brokers, and officials of companies.....	92.1
FEMALES.	
Servants.....	319.7
Telegraph and telephone operators.....	205.1
Bookkeepers, clerks, and copyists.....	198.0
ALL OCCUPIED FEMALES.....	172.8
Mill and factory operatives (textiles).....	144.1
Dressmakers and seamstresses.....	130.1
School teachers.....	126.1
Nurses and midwives.....	100.2
Laundresses.....	94.4

¹ Identical with *consumption* as shown in the diagram; the latter term was employed in the Mortality Statistics of the Census up to the close of the census year 1899-1900.

TABLE 13.—Death rates from all forms of tuberculosis in the registration area, its main subdivisions, the registration states, and cities of 100,000 population or over in 1900, for each year since the beginning of the annual reports on mortality statistics: 1900 to 1907.

AREA.	NUMBER OF DEATHS FROM ALL FORMS OF TUBERCULOSIS PER 100,000 OF POPULATION.								
	Annual average: 1901 to 1905.	1900	1901	1902	1903	1904	1905	1906	1907
The registration area.....	193.2	201.2	196.8	184.7	189.0	201.5	193.6	184.2	183.6
Registration cities.....	213.0	221.8	216.3	204.4	209.4	222.4	212.2	210.0	207.4
Registration states.....	181.5	194.5	189.2	173.5	176.6	187.8	180.4	180.0	179.6
Cities in registration states.....	211.5	230.2	221.6	203.6	207.3	218.2	207.2	213.9	210.9
Rural part of registration states.....	143.5	153.5	149.6	136.0	137.7	148.7	145.3	140.4	142.5
Registration cities in other states.....	214.5	213.5	210.9	205.2	211.6	226.6	217.4	201.5	199.7
Registration states:									
California.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	267.1	278.9
Colorado.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	277.6	289.4
Connecticut.....	170.1	189.9	181.8	165.0	167.3	164.9	171.8	159.3	167.2
Indiana.....	177.3	187.9	182.7	170.9	171.4	191.4	170.2	165.3	165.4
Maine.....	166.3	182.5	181.9	167.7	153.8	172.8	155.5	158.0	168.8
Maryland.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	204.6	200.2
Massachusetts.....	193.4	212.3	202.8	189.5	183.1	199.3	192.7	183.7	183.4
Michigan.....	103.2	106.8	103.5	98.1	101.4	107.9	104.9	106.4	103.5
New Hampshire.....	154.6	170.3	165.3	150.5	146.0	159.8	151.4	149.8	130.5
New Jersey.....	192.6	205.1	192.4	176.1	189.1	207.1	197.5	199.1	196.4
New York.....	200.0	214.2	211.0	190.7	195.9	204.7	197.9	200.6	198.5
Pennsylvania.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	155.6	153.9
Rhode Island.....	216.0	231.0	222.2	209.3	125.7	209.2	213.9	202.3	200.9
South Dakota.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	97.6	105.1
Vermont.....	139.8	154.5	151.7	136.5	134.9	135.0	141.2	133.6	131.2
Registration cities of 100,000 population or over in 1900:									
San Francisco, Cal.....	328.0	330.2	331.5	324.9	339.4	319.5	322.2	(2)	(2)
Denver, Colo.....	459.4	397.4	430.9	437.1	440.5	493.5	490.3	501.6	486.6
New Haven, Conn.....	200.3	212.9	217.7	217.1	190.2	191.7	186.5	181.4	209.8
Washington, D. C.....	310.1	326.1	330.1	280.9	303.9	317.1	318.3	291.5	280.0
Chicago, Ill.....	177.7	184.6	168.0	165.7	182.2	184.8	185.8	187.2	191.6
Indianapolis, Ind.....	205.0	232.9	204.0	186.1	208.9	234.9	189.9	199.4	240.7
Louisville, Ky.....	233.7	227.6	218.1	210.1	233.7	260.0	244.8	228.6	214.7
New Orleans, La.....	351.7	369.2	339.5	352.9	349.3	370.0	346.2	318.0	332.0
Baltimore, Md.....	266.8	254.6	270.9	252.6	257.7	283.4	269.3	270.9	263.2
Boston, Mass.....	250.5	288.1	271.9	249.9	239.7	248.4	243.1	237.5	221.1
Fall River, Mass.....	189.6	206.0	164.7	186.3	203.1	223.6	170.2	156.7	195.1
Worcester, Mass.....	203.5	230.5	221.8	188.9	203.6	198.1	205.3	189.9	180.3
Detroit, Mich.....	129.6	130.9	127.7	131.6	121.2	142.0	125.3	136.1	123.8
Minneapolis, Minn.....	133.5	157.4	155.2	128.0	145.9	129.9	112.2	123.4	119.0
St. Paul, Minn.....	132.5	150.2	142.5	130.7	114.5	132.0	142.6	126.6	154.3
Kansas City, Mo.....	213.4	205.2	194.2	183.6	216.7	250.9	219.8	196.3	207.6
St. Joseph, Mo.....	79.3	92.2	87.2	100.1	62.4	72.5	75.3	94.9	87.1
St. Louis, Mo.....	224.7	205.7	207.8	201.0	211.2	252.1	248.5	216.9	195.6
Omaha, Nebr.....	114.7	119.9	110.2	113.9	127.0	123.1	99.6	104.7	112.7
Jersey City, N. J.....	247.8	283.4	245.2	234.7	245.3	283.1	230.4	260.5	261.5
Newark, N. J.....	268.2	276.0	254.3	254.3	273.1	281.0	276.4	298.0	291.6
Paterson, N. J.....	205.2	221.5	199.2	194.0	189.0	234.0	208.9	242.0	173.6
Buffalo, N. Y.....	149.7	134.5	148.4	135.3	145.7	159.4	159.2	155.0	152.6
New York, N. Y.....	248.0	273.4	261.4	240.6	245.3	253.1	240.5	248.3	242.2
Bronx borough.....	561.2	284.2	557.0	538.6	564.7	581.4	558.5	534.9	512.6
Brooklyn borough.....	223.1	250.8	234.0	219.6	221.1	234.1	208.1	214.0	204.8
Manhattan borough.....	234.5	292.9	252.3	227.1	232.3	234.4	227.6	239.4	238.1
Queens borough.....	164.8	211.1	196.3	160.9	146.2	163.1	160.8	165.8	162.2
Richmond borough.....	215.4	235.8	222.9	211.8	208.3	186.7	246.8	275.2	223.1

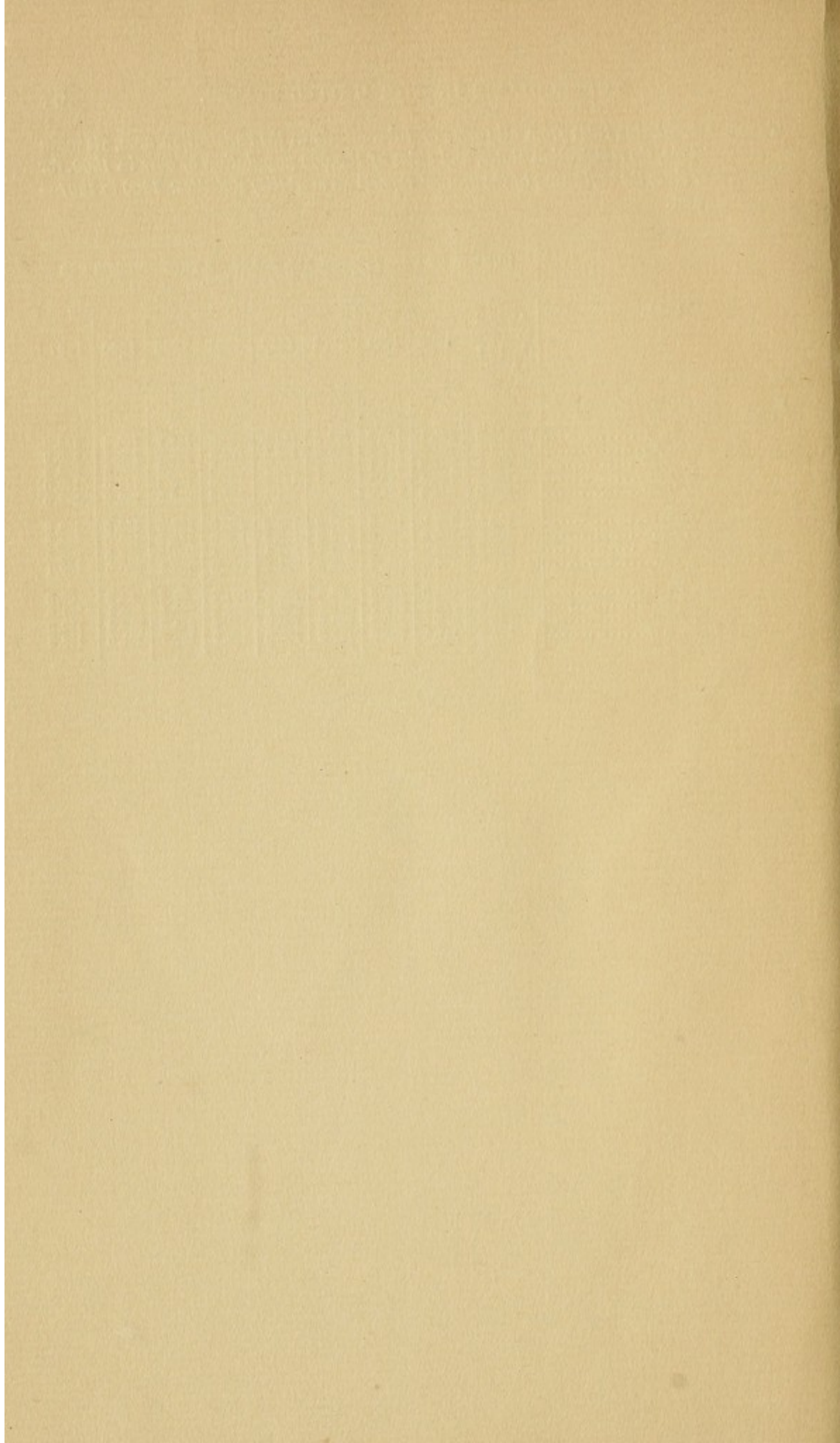
¹ Nonregistration.

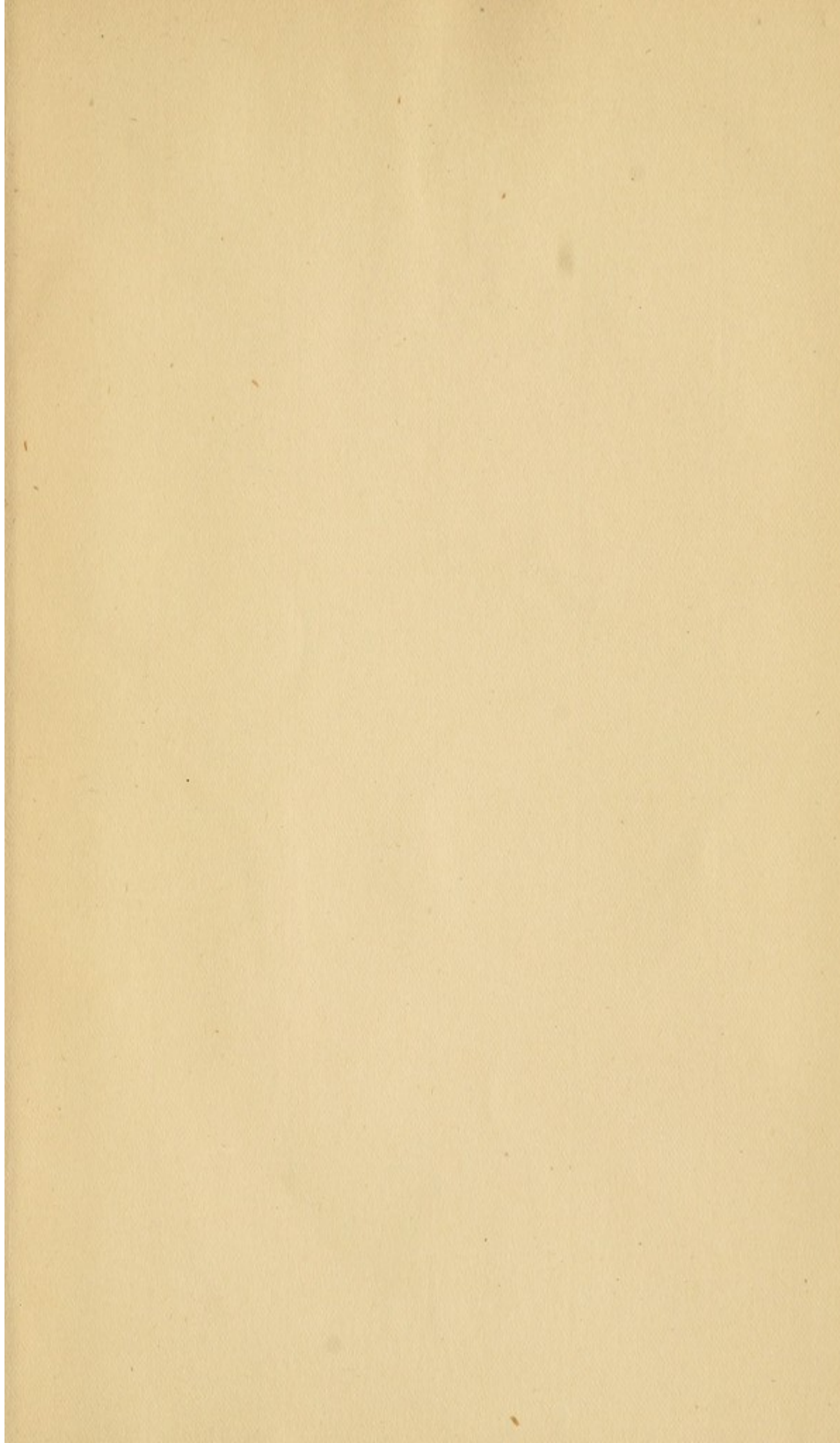
² Population not estimated for 1906 and 1907.

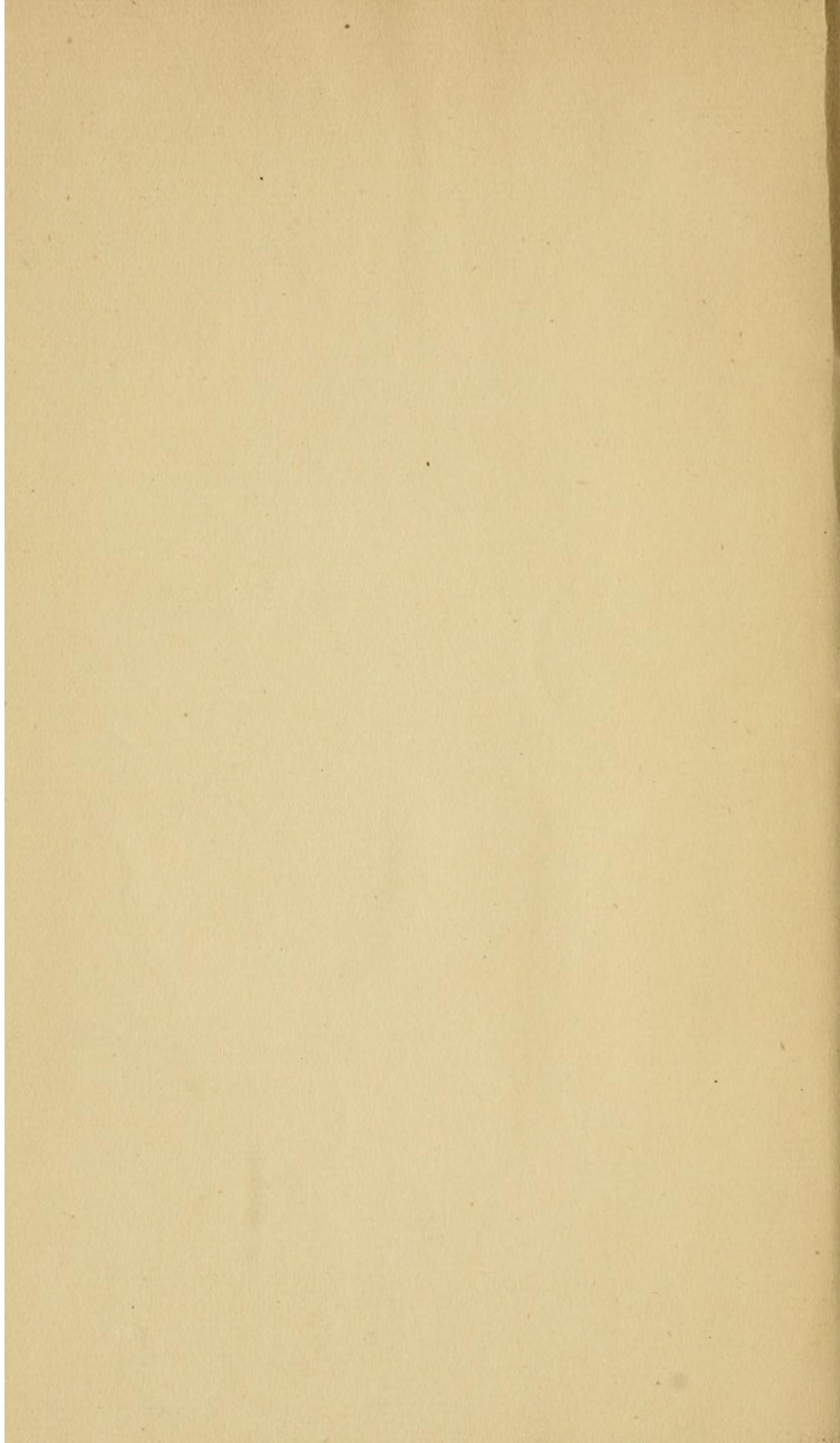
³ For this year, but not for subsequent years, many deaths from tuberculosis in hospitals situated in Bronx borough were transferred to Manhattan and other boroughs whence the cases originated.

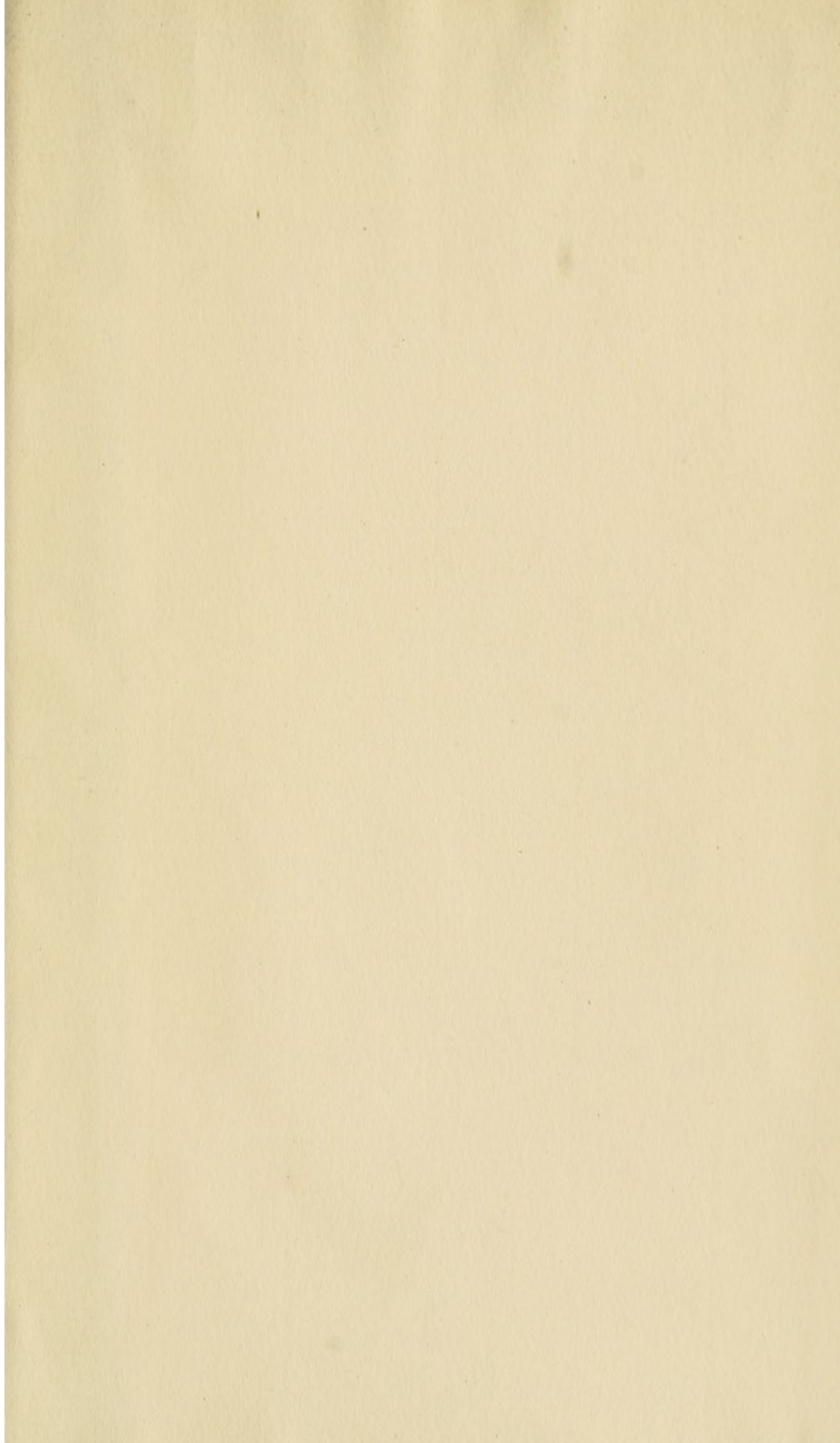
TABLE 13.—Death rates from all forms of tuberculosis in the registration area, its main subdivisions, the registration states, and cities of 100,000 population or over in 1900, for each year since the beginning of the annual reports on mortality statistics: 1900 to 1907—Continued.

AREA.	NUMBER OF DEATHS FROM ALL FORMS OF TUBERCULOSIS PER 100,000 OF POPULATION.								
	Annual average: 1901 to 1905.	1900	1901	1902	1903	1904	1905	1906	1907
Registration cities of 100,000 population or over in 1900—Cont'd.									
Rochester, N. Y.....	154.0	161.1	167.2	128.3	144.6	160.2	168.7	166.4	155.2
Syracuse, N. Y.....	153.5	184.5	174.3	135.9	148.7	170.8	138.3	146.4	149.2
Cincinnati, Ohio.....	273.5	224.0	266.1	235.1	268.5	305.8	290.3	307.3	266.8
Cleveland, Ohio.....	138.8	132.8	122.1	129.1	144.3	156.5	140.5	144.0	149.0
Columbus, Ohio.....	229.0	229.4	225.8	201.3	228.1	257.2	230.8	242.0	232.6
Toledo, Ohio.....	150.5	148.6	140.6	135.9	129.5	180.0	163.6	152.5	168.8
Allegheny, Pa.....	163.3	183.2	157.6	173.3	156.5	173.0	156.1	190.0	156.5
Philadelphia, Pa.....	240.6	239.6	233.2	222.7	246.1	262.8	237.5	259.5	253.5
Pittsburg, Pa.....	171.3	140.8	156.4	159.8	171.6	181.6	185.1	160.0	139.1
Scranton, Pa.....	98.4	106.8	102.3	92.3	102.9	104.2	90.4	84.3	95.6
Providence, R. I.....	246.0	279.1	259.7	251.1	268.7	232.4	220.5	205.1	201.6
Memphis, Tenn.....	234.9	256.1	240.4	269.4	190.9	231.6	243.3	214.4	199.5
Milwaukee, Wis.....	149.4	151.1	153.3	119.2	151.0	159.9	162.7	151.0	138.3









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Tuberculosis in the U. S.

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