

DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF THE CENSUS

E. DANA DURAND, DIRECTOR

BULLETIN 104

MORTALITY STATISTICS: 1908

GENERAL DEATH RATES * CAUSES OF DEATH *
OCCUPATIONAL MORTALITY * SECOND DECEN-
NIAL REVISION OF THE INTERNATIONAL
CLASSIFICATION OF CAUSES OF DEATH



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BULLETINS OF THE PERMANENT CENSUS.

1. Geographical distribution of population.
2. Cotton ginned in the United States, 1899 to 1902.
- *3. Street and electric railways.
4. A discussion of increase of population.
- *5. Central electric light and power stations.
6. Mineral industries of Porto Rico.
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8. Negroes in the United States.
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- *10. Cotton ginned in the United States, 1899 to 1903.
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13. A discussion of age statistics.
14. Proportion of the sexes in the United States.
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LETTER OF TRANSMITTAL.

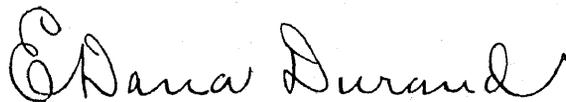
DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF THE CENSUS,
Washington, D. C., September 21, 1909.

SIR:

I have the honor to transmit Census Bulletin 104, on Mortality Statistics, 1908. It presents some of the most important data relating to general death rates, causes of death, and occupational mortality for the registration area during the year 1908 in advance of the more detailed presentation which will appear in the annual report. The report itself, Mortality Statistics, 1908, will appear at an earlier date than formerly, and the publication of this early bulletin is possible on account of the promptness with which state and city registration officials are now making returns of deaths to this Bureau. It contains also the official English translation of the Second Revision of the International Classification of Causes of Death, Paris, 1909, which will be in force for the mortality statistics compiled by this Bureau and by the registration states and cities of the United States, beginning January 1, 1910.

The bulletin was prepared by Dr. Cressy L. Wilbur, chief statistician for vital statistics of this Bureau.

Very respectfully,



Director.

Hon. CHARLES NAGEL,
Secretary of Commerce and Labor.

(5)

MORTALITY STATISTICS: 1908.

INTRODUCTION.

This is the first bulletin prepared upon the annual returns of deaths from the registration area of the United States. Its publication will precede that of the annual report (Mortality Statistics: 1908) by some time, and will enable the most important results of the registration of deaths for the year 1908 to be utilized without waiting for the fuller analysis and comparison of data in the regular report. The timely issue of such a bulletin was not possible until the transcripts of death certificates were returned monthly instead of yearly from the registration states and from the larger registration cities in the nonregistration area. The substitution of monthly for yearly returns permitted much of the preliminary work of compilation to be done during the calendar year covered by the statistics, and thus the compilation for the year has been completed more promptly than in the past. This was brought about by the cordial cooperation of state and city registrars with the Bureau of the Census. In some instances state laws were amended for this purpose. Doubtless the few states not now affording monthly returns will soon appreciate the advantages of this requirement.

SOURCES OF DATA.

The *registration area* of the United States, which embraces those states and separate cities accepted as having approximately complete registration of deaths* based upon the requirement of compulsory burial permits, consists, for the year 1908, of the following states:

California.	Massachusetts.	Rhode Island.
Colorado.	Michigan.	South Dakota.
Connecticut.	New Hampshire.	Vermont.
Indiana.	New Jersey.	Washington.
Maine.	New York.	Wisconsin.
Maryland.	Pennsylvania.	

Of these, Washington and Wisconsin were added for 1908 and now for the first time appear in the list of registration states. The District of Columbia (city of Washington) and 74 cities in nonregistration states, together with the registration states, make up the aggregate registration area, whose total estimated population for the year 1908 was 45,028,767, or over one-half (51.8 per cent) of the

total estimated population of continental United States (86,874,990). The total number of deaths returned for the year was 691,574. It thus appears that the United States, although not possessing the general national system of registration of vital statistics found in other countries, is nevertheless in receipt of a vast mass of registration returns, whose annual compilation is of great service to sanitarians. Unfortunately there are as yet no Southern registration states, and thus only a small proportion of the colored population of the country is represented in the returns received.

EXTENSION OF THE REGISTRATION AREA.

The growth of the registration area from the time that the first transcripts of deaths from actual registration records were received in 1880 to the present time is shown in the following table:

YEAR.	Population of continental United States.	POPULATION OF REGISTRATION AREA.	
		Number.	Per cent.
Census year 1879-1880.....	50,155,783	8,538,366	17.0
Census year 1889-1890.....	62,622,250	19,659,440	31.4
Census year 1899-1900.....	75,994,575	28,807,269	37.9
Calendar year 1900.....		30,765,618	40.5
Calendar year 1901.....	77,292,021	31,292,190	40.5
Calendar year 1902.....	78,589,669	31,908,655	40.6
Calendar year 1903.....	79,922,397	32,530,989	40.7
Calendar year 1904.....	81,261,856	33,185,453	40.8
Calendar year 1905.....	82,574,195	33,757,811	40.9
Calendar year 1906.....	83,941,510	40,996,317	48.8
Calendar year 1907.....	85,532,761	41,758,037	48.8
Calendar year 1908.....	86,874,990	45,028,767	51.8

The addition of Ohio for the year 1909 has still further increased the percentage of the population reporting to 55.2, and some other areas may be included for the calendar year 1910, for which year direct comparisons can be made of the mortality statistics with the population enumerated by the Thirteenth Census. It is very desirable that those states which require burial permits, but which have not yet been admitted as registration states, should enforce more thoroughly the existing laws, and that cities in nonregistration states should adopt or enforce this requirement of burial permits, so that as large an addition as possible can be made to the registration area for the year 1910. An important part of the work of the Bureau of the Census is to secure for this purpose the adoption of better laws and the more effective enforcement of existing laws.

MORTALITY STATISTICS.

SUMMARY OF RESULTS.

The text of this bulletin is divided into three parts: (1) General discussion of the gross returns; (2) causes of death; and (3) relation of occupations to deaths. Besides the text tables, reference may be made to the general tables, the first three of which give detailed data concerning the total number of deaths, death rates, color, month of death, age, and important causes, for each of the main subdivisions of the registration area, the registration states, and all registration cities; the fourth of which compares for the past five years the deaths and death rates for each of the causes of death given in the present form of the International Classification; and the remaining tables are devoted to the relations of causes of death and occupations as reported for the year.

DEATHS AND DEATH RATES FOR THE YEAR 1908.

The total number of deaths returned for the year 1908 from the entire registration area was 691,574, and the death rate was 15.4 per 1,000 of estimated population. For the preceding year the number of deaths was 687,034, or only 4,540 less than the number returned for 1908, although the registration area for the latter year was increased by the addition of the two new registration states, Washington and Wisconsin. The year 1908 was a year of remarkably low mortality throughout the United States, so far as can be determined from the available registration records, and was marked by a general absence of severe epidemics and of unusual mortality from other causes. In Table 1 death rates are presented for all the registration states and cities for which estimates of population are available, and the low rates shown for practically all parts of the country are very noticeable. In a few exceptions, where the rates are somewhat higher, deaths of nonresidents or deaths in institutions may affect the local rates.

DEATHS BY SEX AND AGE.

The distribution of the deaths returned for 1907 and 1908 may be examined with respect to sex and age in the following table.

Females contributed a slightly larger proportion of the deaths in 1908 than they did in 1907, and the actual number of deaths of males registered for 1908 was less than for 1907. The figures for age show a somewhat increased per cent of deaths of infants under 1 year for 1908, but the ratios for each of the individual years from 1 to 4 are identical for 1907 and 1908. A close agreement appears in the subsequent quinquennial periods, although the distribution is slightly more favorable for 1908 for the ages 15 to 49 years.

Nearly one-fifth of all of the deaths that occurred were those of infants under 1 year of age, and over one-fourth are of children less than 5 years of age. The brute force of the figures representing the actual deaths is more impressive, however, than any ratios or than the rates of infant mortality, even if the latter could be computed in the absence of proper registration of births: There were more than one-eighth of a million (136,432) deaths of babies under 1 year of age in about one-half of the total population of the United States in 1908, and nearly 200,000 (*fully* 200,000 with allowance for defective returns) deaths of little children under 5 years of age in the same aggregate of population. It is a matter of conjecture, in the absence of reliable registration of deaths for the remaining half of the country, whether these figures, if doubled, would represent the approximate number of deaths at these ages in the entire United States.

SEX AND AGE.	1907		1908	
	Number of deaths.	Per cent.	Number of deaths.	Per cent.
Aggregate.....	687,034	100.0	691,574	100.0
Sex:				
Male.....	375,990	54.7	375,497	54.3
Female.....	311,044	45.3	316,077	45.7
Age:				
Under 1 year.....	131,110	19.1	136,432	19.7
1 year.....	27,565	4.0	27,833	4.0
2 years.....	12,019	1.8	12,415	1.8
3 years.....	7,634	1.1	7,739	1.1
4 years.....	5,446	0.8	5,440	0.8
Under 5 years.....	183,774	26.8	189,865	27.5
5 to 9 years.....	15,287	2.2	15,822	2.3
10 to 14 years.....	10,513	1.5	10,588	1.5
15 to 19 years.....	18,359	2.7	18,145	2.6
20 to 24 years.....	27,376	4.1	27,137	3.9
25 to 29 years.....	29,415	4.3	28,635	4.1
30 to 34 years.....	30,174	4.4	29,056	4.2
35 to 39 years.....	32,844	4.8	31,188	4.5
40 to 44 years.....	31,233	4.6	30,566	4.4
45 to 49 years.....	32,652	4.8	32,717	4.7
50 to 54 years.....	33,610	4.9	34,128	4.9
55 to 59 years.....	34,360	5.0	34,738	5.0
60 to 64 years.....	39,287	5.7	39,417	5.7
65 to 69 years.....	41,495	6.0	41,506	6.0
70 to 74 years.....	41,265	6.0	41,306	6.0
75 to 79 years.....	36,429	5.3	37,419	5.4
80 to 84 years.....	26,778	3.9	27,219	3.9
85 to 89 years.....	14,352	2.1	14,787	2.1
90 to 94 years.....	4,687	0.7	4,932	0.7
95 years and over.....	1,380	0.2	1,502	0.2
Unknown.....	1,240	0.2	901	0.1

The general death rate of a country is largely dependent upon its infant mortality, because the death rates of infants and young children are high and they affect a relatively numerous element of the population. Exact study of the incidence of disease upon infancy and childhood is most important, and it is imperatively necessary that there should be more effective registration of births throughout the United States for this purpose. The extremely important rate known as "infant mortality" is the ratio of deaths of infants under 1 year of age, not to population, but to the number of children born alive during the year. This most important ratio should be readily available for the comparative study of deaths of infants in all of our states and

cities, but in the great majority of them, unfortunately, the registration of births is worthless, and ratios calculated upon the returns would be deceptive and unreliable.

The possibility of great saving of human life during infancy and early childhood is emphasized by the estimates made by Prof. Irving Fisher, on the basis of independent medical opinions, for his Report on National Vitality to the National Conservation Commission,¹ as to the "ratio of preventability (postponability), i. e., ratio of 'preventable' deaths from cause named to all deaths from cause named" for certain diseases of early life. Out of every 100 deaths that occur from each disease in which the median age at death is under 5 years, there could be prevented the following numbers: Premature birth, 40; congenital debility, 40; venereal diseases, 70; diarrhea and enteritis, the most important cause of infant mortality, 60; measles, 40; acute bronchitis, 30; bronchopneumonia, 50; whooping cough, 40; "croup" (which means diphtheria), 75; meningitis, 70; diseases of larynx other than laryngitis, 40; laryngitis, 40; diphtheria (under its proper appellation), 70; scarlet fever, 50. Other diseases especially fatal to infants and children would perhaps show equally great ratios of preventability; they do not appear in the above list because their median ages are above the limit chosen or because, as is the case with "convulsions," they are grouped with other and incongruous causes. The possible saving of life for "general, ill-defined and unknown causes (including 'heart failure,' 'dropsy,' and 'convulsions')," median age 35 years, is 30 per cent. The median age of "convulsions" alone is less than one year, and it is probable that at least the ratio of preventability of diarrhea and enteritis (60 per cent) would apply to it. The term is an indefinite one, being expressive merely of the symptoms attending the true cause of death, nevertheless no fewer than 6,450 deaths were compiled therefrom for 1908, although, in compilation, any other definite cause is preferred. The term is no longer employed by well-informed physicians in reporting causes of death, and it is possible, by inquiry made by the local registrar immediately after the receipt of this and other unsatisfactory statements, to practically

eliminate them from the returns, as has lately been done for Chicago.

In the light of the figures quoted above it would seem that practical sanitation has only made a beginning in the work of preventing the occurrence of infant and child mortality. The ground has only been scratched over. Deep stirring of the soil and thorough cultivation of all of the means available, with our present scientific and medical knowledge, for the guarding of young human lives would produce startling, and from all past human experience almost unbelievable, results. Public health, as a function of government, is itself only a creation of the middle part of the last century, dating from the utilization of the knowledge available as a result of the operation of the English laws for the registration of vital statistics (1837). Even in England, however, no systematic efforts have been made until very recent years to utilize to their utmost possibilities the facts already known. The infant mortality of England was higher for the years 1896 to 1900 than for the years 1861 to 1865, and no marked reduction in the early rates occurs until the present decade. It is time that greater attention be given to the subject in the United States. For the accomplishment of effective work in this direction, the prompt registration of all births and the more careful and precise statement of causes of death by physicians are essential. Such terms as "convulsions," "marasmus," "debility," and the like should no longer be tolerated when the true cause of death can be determined. Professor Fisher concludes that of all the diseases of infancy (having median age 1), 47 per cent may be prevented, and of the diseases of childhood (having median age 2 to 8), 67 per cent may be prevented, on the basis of our present knowledge of sanitary measures. This would mean, applied to the 200,000 deaths of infants and children in the registration area, or the possible 400,000 deaths of these classes in the United States, a saving of at least 100,000 or 200,000 lives *each year*, respectively. It does not seem unreasonable, when we consider the fact that there is apparently no reason why infants, if *properly born* (and this means simply the prevention of antenatal disease and the improvement of the health and conditions of living of their parents), should die at all in early infancy or childhood except from the comparatively small proportion of accidents that are strictly unavoidable.

¹ Bulletin of the Committee of One Hundred on National Health, being a Report on National Vitality, its Wastes and Conservation, prepared for the National Conservation Commission, by Prof. Irving Fisher, of Yale University, Member of the Commission. July, 1909.

DEATHS BY COLOR AND NATIVITY.

The general distribution of the deaths in the registration area by color and nativity may be compared for the past two years in the following table:

COLOR, NATIVITY, AND PARENT NATIVITY.	1907		1908	
	Number of deaths.	Per cent.	Number of deaths.	Per cent.
Aggregate.....	687,034	100.0	691,574	100.0
White.....	640,971	93.3	645,562	93.3
Native.....	456,194	66.4	464,085	67.1
Both parents native.....	227,301	33.1	231,745	33.5
One or both parents foreign.....	164,956	24.0	171,637	24.8
Parentage unknown.....	59,569	8.7	56,683	8.2
Parentage not stated.....	4,368	0.6	4,020	0.6
Foreign.....	174,270	25.4	171,834	24.9
Unknown.....	10,507	1.5	9,643	1.4
Colored.....	46,063	6.7	46,012	6.7
Negro.....	43,302	6.3	43,113	6.2
Indian.....	1,120	0.2	1,306	0.2
Chinese.....	958	0.1	984	0.1
Japanese.....	683	0.1	609	0.1

For each year 93.3 per cent of all deaths were those of white persons, a fact which shows the unequal division of the registration area in this respect. Maryland is the only registration state with a considerable proportion (23.6 per cent) of colored population. Nearly one-fourth of all deaths registered are those of persons born outside of the United States. The states having the largest proportions of native-born Americans are the ones in which it is the most difficult to secure the passage of effective registration laws. The true American mortality is thus not fully represented in the registration area, although over two-thirds of the deaths registered are those of native-born persons and one-third are of native-born with native parents. A detailed statement of the number of decedents of each color may be found, for the main subdivisions of the registration area, the registration states, and all registration cities of 8,000 population and over in 1900, in Table 1.

DEATHS BY MONTH OF OCCURRENCE.

Table 1 also presents for the principal subdivisions of the registration area, registration states, and registration cities a statement of the number of deaths from all causes registered for each month of the year 1908. This table shows the deaths as for the months in which they actually occurred, not the months in which they may have been registered. It has been the practice of some registration offices in presenting tables of deaths by months to give the deaths registered during the month, as distinguished from the deaths actually occurring during the month, some of which are not registered until the first few days of the month following. Such monthly compilations of reported deaths would not agree with the compilation made by the Bureau of the Census from the individual

transcripts, nor would the state or city reports agree when the monthly totals of reported deaths are consolidated to form the annual report. As a rule, the discrepancies from this cause are trifling in numerical amount, but they prevent the precise agreement which should be expected in statistical compilations based upon the same original data. Under the Rules of Statistical Practice adopted by the registration officials of the United States (see Mortality Statistics, 1907, page 490), the actual deaths are to be accepted as the basis of statement, and special regulations are now in force relative to transcripts made for the Bureau of the Census so that exact agreement shall be secured in this respect.

A general idea of the monthly and seasonal occurrence of deaths can be obtained from the gross figures, although, for exact comparisons, the varying lengths of the calendar months must be taken into consideration. The difference is marked between the number of deaths registered for the month of maximum mortality (January, 67,763) and that of minimum mortality (June, 49,701), but detailed comparisons, involving climatic considerations, are preferably made for individual states and cities.

DEATH RATES FOR REGISTRATION STATES.

The first measure of comparative mortality is the general death rate or the ratio of the deaths that occurred to the population affording them. A comparison of general death rates makes no allowance for differences in the sex and age constitution of the inhabitants of the state and country, and it must be remembered that a community which has an excessive proportion of infants or of old persons will have normally higher death rates than one in which the usual proportion exists; also that states and cities which have been rapidly growing by the influx of young adults, in the healthiest periods of life, will show crude death rates much below the average. Through ignorance or neglect of this fact, many absurd claims, such as being the "healthiest city" or the "healthiest state," have been made, based on the very low death rates sometimes presented. Gross death rates of soldiers have even been compared with the rates of ordinary populations, and invidious comparisons, that a little more knowledge of the proper use of such rates would prevent, are frequent. On the other hand, undue suspicion has sometimes attached to very low rates which are quite justifiable when the age and sex constitution of the community is considered. At their best, however, the death rates computed for a year so remote from the last census of population (1900), and therefore dependent upon *estimates* of the number of inhabitants in each state and city, must be used with discretion, and it is far safer to employ them for the important purpose of detecting the variations in the

SUMMARY OF RESULTS.

mortality of individual states and cities during a series of years than for the exact comparison of the mortality of different states and cities.

The following table gives the death rates per 1,000 of estimated population for the registration states during the past five years and for the quinquennial period 1901 to 1905:

REGISTRATION STATE.	NUMBER OF DEATHS FROM ALL CAUSES ¹ PER 1,000 OF POPULATION.					
	Annual average: 1901 to 1905.	1904	1905	1906	1907	1908
Total.....	15.9	16.4	15.9	16.1	16.4	15.3
California.....	(²)	(²)	(²)	17.4	18.6	18.4
Colorado.....	(²)	(²)	(²)	15.9	17.6	17.0
Connecticut.....	16.0	15.9	16.5	16.7	17.1	15.4
Indiana.....	13.0	13.5	12.8	12.5	12.5	12.3
Maine.....	16.0	16.5	16.2	16.2	16.6	16.0
Maryland.....	(²)	(²)	(²)	15.7	16.1	15.5
Massachusetts.....	16.6	16.3	16.8	16.6	17.5	16.5
Michigan.....	13.3	13.6	13.5	14.3	13.9	13.8
New Hampshire.....	16.4	16.0	17.0	17.3	17.1	16.3
New Jersey.....	16.1	16.9	15.8	16.2	16.6	15.4
New York.....	17.1	18.0	17.0	17.1	17.5	16.3
Pennsylvania.....	(²)	(²)	(²)	16.5	16.5	15.7
Rhode Island.....	17.8	17.2	17.1	17.5	18.0	16.2
South Dakota.....	(²)	(²)	(²)	8.8	9.8	10.1
Vermont.....	16.2	16.0	17.0	16.8	16.2	16.0
Washington.....	(²)	(²)	(²)	(²)	(²)	14.8
Wisconsin.....	(²)	(²)	(²)	(²)	(²)	11.6

¹ Exclusive of stillbirths.

² Nonregistration.

The death rate of the registration states (15.3), which is slightly lower than that for the entire registration area (15.4), is the lowest on record, and is probably the lowest death rate that has ever occurred in the United States. The death rate of the rural portions of these states was even lower (14), that of the urban population (16.5), which term includes all cities having 8,000 or more inhabitants in 1900. The civilized world has indeed arrived at an era of low mortality. Such rates would have seemed quite out of the question a few years ago. That of England and Wales for 1908 was only 14.7 per 1,000 of population and of London for the same year only 13.8. For each year since 1903 the death rate of England and Wales has been less than 16 per 1,000, with the exception of 1904 (16.2), while no rates as low have been recorded for any previous years of registration.

The death rates of the individual registration states vary for the year 1908 from 18.4 for California to 10.1 for South Dakota. But California, and also Colorado (17), suffer unduly in comparison with the other states from the fact that many invalids from other parts of the country resort to them for cure, so that a considerable proportion of the mortality assigned to them on the basis of deaths actually occurring is due to the mortality of recent residents. At the present time, and until a general plan can be adopted for the proper distribution of deaths of recent residents, the figures

must be understood to be somewhat less favorable than the incidence of mortality of the resident population. Even as it is, however, the rates are not high ones, and the total variation from South Dakota (10.1) to California (18.4) is less than that among the great towns of England, for example, for 1908: Hornsey (8.3), Oldham (19.8). The range of mortality is not excessive, and there are no rates so low as to be *per se* unworthy of credence. It is probably true, however, that the registration of deaths in South Dakota is not as complete as that in Massachusetts, and the increase in the death rate of South Dakota from 8.8 for 1906 to 10.1 for 1908 does not necessarily imply an actually higher mortality, but merely more thorough enforcement of the law.

With the exception of South Dakota, all the registration states for which data are presented for more than a single year showed lower rates for 1908 than for 1907, and in several instances the rates for 1908 were the lowest on record, at least since fairly accurate registration has been in effect. For Massachusetts a comparison of the rates given in the state reports since 1851 shows that, with the single exception of the rate in 1904 (16.3), the rate in 1908 (16.5) is the lowest.

DEATH RATES OF LARGE CITIES.

Similar comparisons, which should be used with like caution, may be made of the death rates of the larger cities of the United States—those with 100,000 of population or over in 1900—in the following table:

REGISTRATION CITY.	NUMBER OF DEATHS FROM ALL CAUSES ¹ PER 1,000 OF POPULATION.					
	Annual average: 1901 to 1905.	1904	1905	1906	1907	1908
San Francisco, Cal.....	20.9	20.8	20.1	(²)	(²)	(²)
Denver, Colo.....	19.3	19.6	19.2	21.1	23.5	23.6
New Haven, Conn.....	17.5	17.2	18.7	19.1	18.6	16.9
Washington, D. C.....	20.6	20.8	20.5	20.5	20.3	19.3
Chicago, Ill.....	14.3	13.8	13.8	14.2	15.3	14.0
Indianapolis, Ind.....	15.2	16.3	14.1	14.6	15.2	13.5
Louisville, Ky.....	18.6	19.8	18.1	18.2	18.1	16.0
New Orleans, La.....	22.6	22.3	23.7	21.7	24.0	22.7
Baltimore, Md.....	19.7	20.1	19.6	19.4	19.9	18.3
Boston, Mass.....	18.8	18.3	18.5	18.9	19.2	19.1
Fall River, Mass.....	20.3	19.6	19.9	19.7	22.5	22.1
Worcester, Mass.....	16.8	16.2	17.7	17.8	19.6	17.4
Detroit, Mich.....	15.2	14.9	14.4	17.0	16.5	15.6
Minneapolis, Minn.....	10.2	9.6	9.4	10.3	10.4	10.3
St. Paul, Minn.....	10.0	10.0	10.0	10.3	10.6	10.1
Kansas City, Mo.....	17.2	19.7	16.9	15.3	18.0	16.8
St. Joseph, Mo.....	7.7	7.9	7.6	8.2	9.2	8.3
St. Louis, Mo.....	17.8	18.8	16.9	15.6	15.7	14.5
Omaha, Nebr.....	11.1	11.5	10.8	11.4	12.4	12.1
Jersey City, N. J.....	19.3	20.8	19.0	19.5	19.5	17.8
Newark, N. J.....	18.7	19.5	17.7	19.2	19.5	17.3
Paterson, N. J.....	16.9	18.0	16.6	17.7	16.1	16.2
Buffalo, N. Y.....	15.5	16.0	15.6	16.6	17.1	15.9
New York, N. Y.....	19.0	20.1	18.4	18.6	18.7	16.8
Bronx borough.....	20.9	21.5	20.3	21.9	21.1	20.1
Brooklyn borough.....	18.2	18.8	17.6	18.0	18.2	16.3
Manhattan borough.....	19.5	21.2	18.8	18.5	18.7	16.7
Queens borough.....	16.1	16.1	16.1	17.3	17.8	15.9
Richmond borough.....	19.0	20.4	19.2	20.0	21.2	19.6

¹ Exclusive of stillbirths.

² Population not estimated.

MORTALITY STATISTICS.

REGISTRATION CITY— continued.	NUMBER OF DEATHS FROM ALL CAUSES ¹ PER 1,000 OF POPULATION.					
	Annual average: 1901 to 1905.	1904	1905	1906	1907	1908
Rochester, N. Y.	14.6	15.0	15.3	15.5	16.2	14.6
Syracuse, N. Y.	14.5	15.2	15.5	15.5	15.9	16.5
Cincinnati, Ohio.	19.3	20.8	19.2	20.8	18.5	18.5
Cleveland, Ohio.	15.5	15.4	14.7	16.0	16.2	14.2
Columbus, Ohio.	15.9	16.9	15.7	16.2	16.6	16.4
Toledo, Ohio.	14.1	13.7	13.7	14.7	14.7	14.0
Allegheny, Pa.	18.4	17.8	18.8	17.9	17.3	(²)
Philadelphia, Pa.	18.2	18.8	17.7	19.3	18.7	17.4
Pittsburg, Pa.	20.7	19.8	20.0	19.9	19.2	³ 16.5
Scranton, Pa.	16.3	17.9	18.2	16.5	15.9	16.5
Providence, R. I.	18.8	18.5	17.5	18.7	19.3	16.8
Memphis, Tenn.	18.3	19.5	17.9	17.6	19.0	17.5
Milwaukee, Wis.	13.2	13.6	13.0	14.5	14.4	13.6

¹ Exclusive of stillbirths.² Annexed to Pittsburg, December 9, 1907.³ Includes Allegheny.

The cities in the preceding table are arranged in order of states, so that comparisons can be made con-

veniently of those located in the same parts of the country. Of the 35 cities for which rates are presented for 1908 and for preceding years, a decreased death rate is shown for 1908 in all but five instances. The rate for Denver, Colo., which, like that for Colorado as a whole, is affected by the deaths of nonresidents, increased from 23.5 for 1907 to 23.6 for 1908—an insignificant difference; the rates for Syracuse, N. Y., and for Scranton, Pa., each rose from 15.9 to 16.5; while the rate for Paterson, N. J., rose from 16.1 to 16.2. Cincinnati, Ohio, showed the same rate for each year, namely, 18.5. The five boroughs of New York also showed decreased death rates for the year; that for the Borough of the Bronx is higher than those for the other boroughs on account of the inclusion of deaths in hospitals of patients from Manhattan.

CAUSES OF DEATH.

The number of deaths and the corresponding death rates per 100,000 of estimated population from certain important causes are given for the main subdivisions of the registration area, the registration states, and individual registration cities of 8,000 population and over (census of 1900) for the year 1908 in Table 3. This table is in form similar to general Table 3 and also to the regular summary table (Table IV) of the Mortality Statistics, 1907, containing the death rates of these areas for each of the years 1903 to 1907, so that comparisons can readily be made with previous years.

For the registration area as a whole, the deaths and death rates may be examined for each of the past five years (1904 to 1908) in Table 4, which also contains the average annual number of deaths and the corresponding death rate per 100,000 of mean estimated population for the quinquennial period 1901 to 1905. This table is identical with Table III of the annual report.

The first point usually considered in connection with the mortality of the latest year of registration is whether the deaths and death rates from certain important causes were greater or less than for the year preceding. Such comparisons can be made in Table 5, which presents the figures for 1907 and 1908 for the registration area and its main subdivisions, the registration states, and the large cities of 100,000 of population and over in 1900 for the following important causes of death: Typhoid fever, measles, scarlet fever, whooping cough, diphtheria and croup, tuberculosis (all forms), cancer, heart disease, pneumonia (all forms), diarrhea and enteritis, Bright's disease, suicide, and other violence. Rates in excess of certain fairly high limits, which vary for the different diseases, are printed in bold-face type, so that the localities having excessive mortality from a given cause can be seen at a glance. As the table is arranged similarly to those of the last annual report relating to each individual disease, comparisons can readily be made

for preceding years. It should be remembered that differences in age and sex constitution, color, nativity, and other peculiarities of the population, may greatly affect the relative mortality of states and cities, and that the crude rates are therefore much better employed for the purpose of ascertaining the variations in the same area than for comparing different areas. The rates from tuberculosis in certain states and cities are high chiefly on account of the mortality of non-resident health seekers.

For the rarer causes of death, some of which, however, are of very great sanitary interest, reference may be made to Table 4. Smallpox caused 92 deaths in the registration area during 1908, corresponding to a rate of two-tenths per 100,000 of population. The deaths returned from this cause numbered 74 for 1907 and 95 for 1906. The disease is now much less prevalent than for the five-year period 1901 to 1905 which, for a considerably smaller registration area, showed an average of 1,119 deaths from smallpox per annum. Plague caused 5 deaths in the registration area in 1908 as compared with 89 for the preceding year. Two deaths were also reported from yellow fever, 1 more than the number returned for 1907. From leprosy 11 deaths occurred in 1908 and 7 in 1907. Rabies, commonly known as hydrophobia, caused 82 deaths in 1908.

A disease of increasing importance, according to the returns, is pellagra. Only 23 deaths from this disease were reported for 1908. No deaths from this cause were given for any of the preceding years shown in the table, except 1 for 1904. Undoubtedly many deaths from this disease have occurred during previous years, but the cause has escaped recognition. The number of deaths compiled, moreover, does not at all represent the actual mortality from pellagra in the United States, because nearly all of them occur in the nonregistration states of the South from which no records are received.

TYPHOID FEVER.

The total number of deaths registered from typhoid fever for the entire registration area was 11,375 for 1908 as against 12,670 for 1907. The death rate decreased from 30.3 to 25.3 per 100,000 of estimated population. The latter rate is the lowest yet recorded in any of the annual reports and marks a phenomenally favorable condition with respect to infection by the typhoid germ. The decrease was general throughout the registration area, but was greater in the registration cities, for which the rate declined from 32.9 per 100,000 of population in 1907 to 25.8 for 1908, than in the rural parts of registration states, for which the decrease was only from 26 to 24.3. Of the 15 registration states for which rates are available for the two years, 8 showed decreased death rates from this disease, namely, California, Colorado, Connecticut, Indiana, Maryland, New Jersey, New York, and Pennsylvania, and 7 showed increased mortality for the latter year, usually of small amounts: Maine, Massachusetts, Michigan, New Hampshire, Rhode Island, South Dakota, and Vermont. For 1908 no state showed a rate equal to or above the limit of 50 deaths per 100,000 of population and only 2 of the large cities—Denver, Colo. (54.8), and Columbus, Ohio (110.5)—exceeded this amount, while for 1907, 2 states, Colorado and Pennsylvania, and 7 of the large cities—Denver, Colo.; Louisville, Ky.; New Orleans, La.; Allegheny, Philadelphia, Pittsburg, and Scranton, Pa.—exceeded this limit.

The reduction of the amount of typhoid fever in Allegheny and Pittsburg, Pa., is especially notable. For 1907 the death rate from typhoid fever per 100,000 of population was 96.9 for Allegheny and 130.8 for Pittsburg, and these rates were not exceptionally high for those cities, in which the use of polluted water had been the recognized source of a large number of deaths from this disease year after year. For 1908 the death rate of the present city of Pittsburg, which includes the former city of Allegheny, annexed on December 9, 1907, was only 46.6 per 100,000 of population. Part of this may be due to the unusually favorable character of the year, but a large part is undoubtedly due to the use of the filtering plant recently completed.

Cincinnati, Ohio, for a similar reason, also shows a marked decrease in the typhoid fever death rate from 46.4 in 1907 to 18.6 for 1908. That all of the mortality from typhoid fever is not due to the water supply and that a considerable portion of it may be due to other sources, such as contamination of food by flies and the like, is suggested by the fact that the death rate from typhoid fever in Washington, D. C., shows a slight increase for the year as compared with that preceding, namely, from 35.5 to 39.4. The lowest death rates of the large cities presented in Table 5 are

those of Worcester, Mass. (10.5); Jersey City, N. J. (9.7); Paterson, N. J. (9.5); Richmond borough, New York (9.2). All the other large cities have death rates from this disease exceeding 10 per 100,000 of population, and the average death rate of registration cities in this country from typhoid fever is over 25 per 100,000 of population for even such a favorable year as 1908. The possibilities of reduction of even these favorable rates are suggested by comparison with death rates from enteric (typhoid) fever taken from the statistics of Scottish, Irish, Colonial, and Foreign cities, in the Annual Summary for 1908, published by the Registrar-General of England and Wales: London, 5; Edinburgh, 2; Glasgow, 8; Paris, 8; Rotterdam, 5; The Hague, 1; Copenhagen, 7; Stockholm, 1; Berlin, 4; Hamburg, 4; Dresden, 6; Breslau, 5; Munich, 3; Vienna, 4. Other cities have higher rates, but there are no cities given in the Registrar-General's list with rates as high as the average of American registration cities in a most favorable year (25.8), except St. Petersburg (126), Moscow (56), Milan (38), Montreal (33), and Toronto (28).

MEASLES.

Measles caused 4,611 deaths in 1908 as compared with 4,302 in 1907. As the registration area was increased by the addition of Washington and Wisconsin for 1908, the increase of 309 deaths represents a slightly decreased death rate, namely, from 10.3 to 10.2 per 100,000 of estimated population. These figures for measles thus serve to call attention to the fact that, because of changes in the registration area, minute comparisons can not be made directly between the number of deaths returned for the two years, but that comparisons are preferably made by means of the death rates, which take cognizance of the increased population represented by the returns.

The only state showing unusually high mortality from this disease was South Dakota, for which the death rate was 21.1 per 100,000 of population. The highest mortality among the large cities was that of Fall River, Mass. (45.2), closely followed by Pittsburg, Pa. (45.1). The death rate of the Borough of the Bronx (61.4) is not properly chargeable to the borough on account of deaths in hospitals of patients brought from other parts of the city.

As compared with previous years the mortality for 1908 from measles was not excessive, although slightly above the average for the quinquennial period 1901 to 1905 (9.1). International statistics show a much higher death rate from this disease in London (31), Edinburgh (23), Glasgow (96), Dublin (42), Belfast (48), Paris (18), Brussels (26), Amsterdam (32), St. Petersburg (102), Moscow (44), Trieste (44), Berlin (14), Vienna (46), and Rome (100). While the total death rate is less than half that of typhoid fever, the mortality of the latter is distributed over a longer

period of life, the average age at death being about 30 years, while the average age at death of persons succumbing to measles is less than 4 years and the median age is less than 2 years. Specific death rates computed on the class most largely affected, mainly young children under 5 years of age, would show much higher rates of mortality.

SCARLET FEVER.

For 1907 the death rates from measles and scarlet fever were identical for the registration area (10.3), but while the death rate of measles (10.2) was slightly lower for 1908, that of scarlet fever (12.4) was slightly higher. Colorado showed rates exceeding 20 deaths per 100,000 for each of the two years, although the death rate decreased from 36.5 for 1907 to 28.2 for 1908. New York was the only other state showing a rate (20.5) slightly above the limit chosen. The highest death rate among the large cities from scarlet fever was that of Scranton, Pa. (71), followed by Jersey City, N. J. (42.3), although the Borough of the Bronx, with its hospitals, had apparently a higher rate (43.3). The mortality from scarlet fever was markedly high in the large cities of Massachusetts, New Jersey, and New York, with the exception of Rochester and Syracuse in the last-named state.

In the tables of international statistics presented by the Registrar-General, foreign cities with high rates for the year are Montreal (21), Toronto (20), Rotterdam (38), St. Petersburg (41), Moscow (38), Prague (31), Budapest (32), and Trieste (30).

WHOOPIING COUGH.

Whooping cough caused 4,969 deaths in 1908 and 4,856 in 1907 in the registration area, but the death rate declined from 11.6 to 11 on account of the additions to that area. The mortality was quite uniformly distributed throughout the main subdivisions, although greater variation is shown among the registration states and cities. Colorado had the highest death rate from whooping cough of any of the registration states (22.3). That state also had the highest mortality from scarlet fever and typhoid fever, and a high mortality from measles and diphtheria and croup. Among the large registration cities only 3, Denver, Colo. (21.3), Fall River, Mass. (22.6), and Memphis, Tenn. (21.1), exceeded the limit of prevalence with which the children's diseases are compared (20).

Whooping cough is of much greater importance as a cause of death in the cities of northern Europe than in this country. The death rate of London for 1908 (20) is lower than that of any preceding year or quinquennial period given in the Registrar-General's Annual Summary, and the rates of the following cities exceed the limit used in Table 5: Edinburgh (33), Glasgow (62), Dublin (24), Belfast (35), Montreal (28), Amster-

dam (21), Copenhagen (37), St. Petersburg (27), and Hamburg (24).

DIPHTHERIA AND CROUP.

The total number of deaths from diphtheria and croup returned for the registration area, as occurring during the year 1908, was 10,052, or 102 less than the number returned for the preceding year. As the population of the registration area for 1908 was somewhat greater than that for 1907, owing to the additions to the registration area, the death rate decreased from 24.3 for 1907 to 22.3 for 1908. The death rate for the latter year was the lowest rate recorded since the beginning of the annual reports on mortality. As it has been suggested that diphtheria might be taken as a measure of sanitary efficiency, owing to the fact that deaths from this disease are largely preventable, this decrease may be considered a very satisfactory indication of the general sanitary condition of the country. In this connection it may be stated that the term "diphtheria and croup" does not refer to two separate and distinct diseases, but simply to the one disease properly designated diphtheria. The use of the word "croup" is a relic of old-time pathology; it is chiefly employed by the less progressive class of physicians, and by the laity who do not understand its identity with diphtheria.

The decrease in the death rate from diphtheria was general in all the main subdivisions of the registration area, as shown in Table 5, and in all the registration states except California, Colorado, New Hampshire, Rhode Island, South Dakota, and Vermont. The amounts of increase in these states were slight, except in Colorado, whose death rate from this disease increased from 21.5 per 100,000 of population in 1907 to 28.4 in 1908; Rhode Island, from 24.8 in 1907 to 29.5 in 1908; and South Dakota, where an increase from 16.8 to 21.8 was shown.

During 1908 none of the large registration cities showed a death rate equal to or over 50 per 100,000 from diphtheria and croup, which is the limit formerly employed in the annual reports to call attention to areas having high death rates from this disease. In the present bulletin the reduced limit of 40 is employed, and it is hoped that, as modern efficient health administration prevails and the free supply of antitoxin becomes more general, it will be possible to lower the limit from time to time as diphtheria tends to become a practically extinct disease like typhus fever. As it is, only 2 of the larger cities in 1908 had rates above 40 per 100,000, namely, Denver, Colo. (45.8) and Worcester, Mass. (44.8). The aggregate death rate of the city of New York (39.4) was slightly below the limit.

The mortality from diphtheria and croup was very low in the foreign cities, whose statistics for 1908 are presented in the Annual Summary of the Registrar-General. The highest death rates are those of Toronto

(74), Montreal (34), St. Petersburg (48), Moscow (33), Christiania (28), Berlin (27), and Dresden (37). London had a rate of only 15; Paris, 7; Sydney, 7; Melbourne, 10; Amsterdam, 7; Budapest, 13; and Rome, 16. The lowest rate given is that of Edinburgh, which was only 5 per 100,000.

TUBERCULOSIS (ALL FORMS).

The total number of deaths resulting from all forms of tuberculosis for the registration area for 1908 was 78,289, of which 67,376 were from tuberculosis of the lungs, 698 from tuberculosis of the larynx, 4,218 from tuberculous meningitis, 2,723 from abdominal tuberculosis, and the remainder from minor tuberculous affections, such as Pott's disease, tuberculous abscess, white swelling, tuberculosis of other organs, or those returned as general tuberculosis. There were also 120 deaths from "scrofula," a disease which should be properly included with tuberculous disease.

The total number of deaths returned from all forms of tuberculosis for 1908 exceeded the number returned for 1907 or for any previous year of registration, although direct comparison can not be made on account of the large increase of the registration area in 1906 and the slight increase in 1908.

The death rates per 100,000 of population show a considerable decline for 1908 (173.9) as compared with 1907 (183.6) or any of the previous years given in Table 4.

From Table 5 it appears that the death rate from all forms of tuberculosis showed a decline in all of the main subdivisions of the registration area and also in each of the registration states, except Colorado, Rhode Island, and Vermont. In the two latter the amounts of increase were very small and for Colorado, as well as for California, it must be remembered that many deaths from tuberculosis are those of nonresidents who resort to the climate for the cure of tuberculous disease. The high rates for the cities in Colorado and in the South, and also for the Borough of the Bronx, N. Y., should be interpreted in connection with the knowledge that many deaths of nonresidents or hospital patients are included. It is probable that the great attention that has been given to the prevention of tuberculosis, through the International Congress on Tuberculosis held at Washington in 1908, and the organization of many state and local societies, has already begun to have its effect upon the mortality from this disease, and though an abrupt diminution in the death rate can hardly be expected, a moderate and continued decline from year to year will be highly suggestive of the efficiency of the measures now being actively employed.

CANCER.

The crude death rates from cancer continue to increase and slightly higher rates are recorded for each main subdivision of the registration area. For the

year 1908, 33,465 deaths from this disease were returned, and the death rate was 74.3 per 100,000 of population as compared with 30,514 deaths and a death rate of 73.1 for 1907. Ten of the 15 registration states show increased death rates and 5, namely, Connecticut, Maine, New Hampshire, Rhode Island, and Vermont, show slightly lower rates for the last year. The rates of all of the latter states are high, however, dependent largely upon the relatively high age distribution of the population, which is an important factor in cancer mortality. A decrease is evident in the number of the larger cities showing rates in excess of the limit indicated in the table (80 per 100,000 of population), only 12 being above this rate for 1908, as compared with 16 for the preceding year. Many deaths recorded in cities from this disease are those of persons from the surrounding country who resort to city hospitals for operation, so that the true mortality from this disease can not always be definitely judged.

HEART DISEASE.

The total number of deaths from heart disease compiled for 1908 was 60,038, the largest number ever recorded for the registration area. The death rate, however (133.3 per 100,000 of population), was somewhat lower than that for 1907 (141.7). The term "heart disease" includes many deaths that are not certainly due to organic disease of the heart, although the deaths reported from "heart failure" are not compiled under this designation, but are assigned to the ill-defined and unknown causes. Nevertheless, many deaths that should be reported under other causes are apt to be included under this head, especially those of a sudden character in which no post-mortem examination is held to ascertain the true cause of death.

In Table 5 the rates from this cause in excess of 175 per 100,000 of population are designated by bold-face type. Only 3 states—California (193.8), New Hampshire (181.3), and Vermont (190.6)—and 2 of the larger cities—Washington, D. C. (195), and Worcester, Mass. (178.4)—exceeded this limit. As shown in Table 4, heart diseases have been increasing in importance as causes of death, the rates for each of the last five years being greater than the average for the five-year period 1901 to 1905 (124.9).

PNEUMONIA (ALL FORMS).

The disease properly designated as pneumonia is the lobar or croupous form, but many deaths from this cause are returned simply as "pneumonia," with no special qualification, so that it is uncertain whether they are really deaths from lobar pneumonia or from bronchopneumonia. It is desirable that greater care should be used by physicians in reporting bronchopneumonia and lobar pneumonia, but in the meantime it becomes necessary to compare the total deaths

from all forms of pneumonia in order to show the variation in mortality for the past two years.

In Table 5 the total number of deaths from all forms of pneumonia for 1908 is given as 61,259, a decrease of over 6,000 from the preceding year (67,320). The death rate fell from 161.2 for 1907 to 136 for 1908, and a decreased death rate is noted for each of the main subdivisions of the registration area. By reference to Table 4 it will be seen that the death rate from pneumonia for 1908 was lower than that for any other of the past five years and much below the average for the quinquennial period 1901 to 1905, which was 159.3. The principal decrease, as shown in this table, is in the number of deaths returned from lobar and unqualified pneumonia, the death rate for which was for 1908 only 98.8 as compared with 126.2 for the five years 1901 to 1905. The rate (37.2) for bronchopneumonia was slightly higher for 1908 than that for the five-year period (33.1).

All the registration states, for which data are presented in Table 5, show decreased death rates from pneumonia for 1908 as compared with the preceding year, except only Colorado and South Dakota, in which very slight amounts of increase appear.

The majority of the larger registration cities also show lower rates from this cause, and some of the rates are phenomenally low. The only exceptions to the rule of decreased death rates are Denver, Colo.; Fall River, Mass.; St. Paul, Minn.; Omaha, Nebr.; Paterson, N. J.; Cincinnati, Ohio; and Scranton, Pa. The amounts of increase are small, except for Fall River, Mass. (219.6 to 264.3), and Scranton, Pa. (141.7 to 178.3).

DIARRHEA AND ENTERITIS.

There were 52,213 deaths from diarrhea and enteritis at all ages returned from the registration area for 1908 as compared with 48,739 returned for 1907. The death rate, however, slightly decreased, namely, from 116.7 to 116, owing to the increased population of the registration area. The rate for the year was somewhat higher than the average for the five-year period 1901 to 1905 (109.8), although it must be remembered that the latter rate relates to the registration area in its former extent before the additional territory of 1906 and 1908 was included.

The great majority of the deaths from this disease or aggregation of diseases are of infants under 2 years of age, more especially those nourished otherwise than at the breast. The enormous extent of the mortality of infants from diarrheal diseases may be inferred from the fact that the aggregate death rate, over four-fifths of which is due to deaths of infants under 2 years of age, exceeds 1 per 1,000 of the total population and ranks in the same class for general effect on the death rate as heart disease and pneumonia, diseases whose influence is felt upon all periods of age.

It is unfortunately impracticable to estimate the actual population under 2 years of age so that direct

comparisons can be made. As there is little or no satisfactory registration of births with which the infant mortality from this cause can be properly compared, it is difficult fully to appreciate the great importance of diarrhea and enteritis as a destroyer of infantile life and to present comparable figures therefor. Even as measured upon the scale of the total population, the limit used in Table 5 is a high one (150 per 100,000 of population) and the rates of some cities, especially Fall River, Mass. (380.1), and Scranton, Pa. (208.9), greatly exceed it. The mortality from this disease, due largely to filth and lack of care, is concentrated into a few of the late summer and early fall months, at which time the specific incidence of this disease upon the special age period chiefly affected is extremely high.

BRIGHT'S DISEASE.

Bright's disease, which, as presented in Table 5, includes only the deaths returned from the presumably chronic forms of the disease, with the exclusion of acute nephritis, caused 39,519 deaths in 1907 and 39,203 in 1908, and the death rate decreased from 94.6 to 87.1 per 100,000 of estimated population. The reason for the apparent discrepancy in the amount of decrease is the fact that additional population whose death rate from this disease was below the average was added to the registration area. All of the main subdivisions of the registration area showed reduced death rates for 1908 and fewer of the larger registration cities showed rates above the limit (135 per 100,000 of population), which corresponds very well with the 150 employed in the last annual report for nephritis and Bright's disease conjoined.

SUICIDE.

Suicide apparently caused many more deaths in 1908 than in 1907 or in any previous year given in Table 4. The increase from the number compiled for 1907 (6,745) to the number for 1908 (8,332) is especially marked, and the death rate also rose from 16.2 to 18.5. A similar increase occurred in each main subdivision of the registration area, and all the registration states, except South Dakota, showed higher death rates for suicide for 1908 than for 1907.

The same increase in the death rate is noted in the majority of the larger registration cities, the exceptions being Washington, D. C.; Indianapolis, Ind.; Louisville, Ky.; St. Louis, Mo.; Newark, N. J.; Rochester, N. Y.; Syracuse, N. Y.; Cleveland, Ohio; Pittsburg, Pa.; Memphis, Tenn.; and Milwaukee, Wis. Columbus, Ohio, showed the same rate, a high one (32.9), for each year. The number of deaths from this cause is not very great as compared with other causes, and hence the ratios are susceptible to considerable variations from slight numerical changes. Moreover, owing to a progressive improvement in regard to the

proper reporting of deaths from suicide, many deaths that would formerly have been returned without specification of the true cause are now designated as suicides and compiled as such.

It is likely that all suicides are not yet properly returned as such, so that the apparent increase in the death rate from this cause may continue, although the actual ratio of suicides may remain unchanged. It seems probable, however, from the general distribution of increased mortality in all parts of the country, that some actual increase in the proportion of deaths from suicide occurred in 1908, but not to as large an extent as the figures would indicate.

OCCUPATIONS AND CAUSES OF DEATH.

The relation of occupation to mortality is one of the most important and also one of the most difficult subjects of vital statistics. Difficulties are met with even when the investigation is confined to the aggregate death rates of the various occupations, and are even more in evidence when the effects of individual causes of deaths are to be considered. After a given mass of statistical returns of deaths is subdivided with reference to individual occupations, and the deaths by occupations again subdivided with reference to causes of death, it is evident that, except for the most common occupations and the most common causes of death, the statistical groups are likely to become so much reduced in size as to be unreliable for the computation of rates.

An inherent difficulty in the compilation of reliable statistics of the mortality of occupations is that the data are derived from two different and largely independent sources. The returns of deaths received from registration states and cities are copies of the original certificates of death, upon which the statements in regard to the occupations of decedents may be made by the relatives or friends, by the undertakers, or by the attending physicians. The occupations of the living population are stated by the census enumerators in more or less strict compliance with detailed instructions prepared for their use. It is evident that the accuracy of statement may vary greatly in the two sets of returns, notwithstanding which fact the only method of obtaining the death rates and derived "mortality figures" of occupations is by the direct comparison of the mortality and population returns.

Such a comparison was made for the census year 1900, and the results may be found in the Vital Statistics of the Twelfth Census, Part I. Owing to the peremptory requirement of the census law that the principal reports should be published within two years after the date of enumeration, and the fact that mor-

ACCIDENT.

The total number of deaths from accident compiled for 1908 (44,089) was less than the number compiled for the preceding year (45,803). Owing to the addition of new registration territory the death rate decreased in greater proportion, namely, from 109.7 for 1907 to 97.9 for 1908. All the main subdivisions of the registration area showed lower death rates from violent causes, as did all the registration states except Indiana and Vermont, in which slight amounts of increase appeared. A general decrease in the deaths from violence may also be observed among the larger cities shown in Table 5.

tality rates for occupations could not be computed until the detailed data for population were at hand, the investigation was confined to the returns from the registration states. The aggregate population of the registration states for that year was 17,444,280, consisting of 8,701,245 males and 8,743,035 females. The total number of deaths of males aged 10 years and over was 104,511, of which number 83,815, or 80.2 per cent, were reported as having gainful occupations. Of females aged 10 years and over there were 99,510 deaths, 13,203, or 13.3 per cent, of the female decedents being gainfully employed.

In the interval of seven years since the above report appeared, there has been urgent demand for more information in regard to the relation of occupation to mortality, and the tables presented in this bulletin have been prepared to meet this demand as far as possible, and more particularly to pave the way for more complete and accurate statistics of the mortality of occupations than have heretofore been available. Much work must be done before fully satisfactory results can be obtained, for it is true of all classes of statistical investigation that the completed results can not rise above their source, and when the source is seriously or fatally defective in accuracy the resulting statistics will be questionable.

The occupational data presented in this bulletin, and which will be given in somewhat fuller detail in the annual report on Mortality Statistics for 1908, are derived from the compilation of all of the deaths of persons aged 10 years and over returned from the entire registration area for the year 1908. The aggregate population of this area was estimated, according to the usual method employed by the Census, at 45,028,767 persons, or 51.8 per cent of the total estimated population of continental United States. The distribution of the decedents returned by sex, with specification of the number returned as having been gainfully

employed at each age period, may be seen in the following table:

AGE PERIOD.	DEATHS IN THE REGISTRATION AREA: 1908.					
	Male.			Female.		
	Total.	Occupation stated.		Total.	Occupation stated.	
		Number.	Per cent.		Number.	Per cent.
All ages.....	375,497	196,207	52.3	316,077	26,205	8.3
Total 10 years of age and over.....	292,859	196,207	74.6	223,028	26,205	11.7
Under 10 years.....	112,638			93,049		
10 to 14 years.....	5,437	215	4.0	5,151	85	1.7
15 to 19 years.....	9,317	5,433	58.3	8,628	2,207	25.7
20 to 24 years.....	14,503	11,999	82.7	12,634	3,543	28.0
25 to 34 years.....	31,642	27,366	86.5	26,049	4,997	19.2
35 to 44 years.....	35,741	30,632	85.7	26,013	4,220	16.2
45 to 54 years.....	39,120	33,192	84.8	27,725	4,101	14.8
55 to 64 years.....	41,460	33,301	80.3	32,035	3,852	11.8
65 years and over.....	84,961	53,741	63.3	83,710	3,117	3.7
Unknown.....	678	328	48.4	223	23	10.3

The number of deaths of occupied males 10 years of age and over (196,207) is more than double the number (83,815) included in the last compilation, but the per cent which such deaths form of all deaths reported (74.6) is less than the corresponding per cent for the year of the Twelfth Census (80.2). This may be due to a decreased accuracy of statement of occupations upon the original certificates of death, to the fact that a certain proportion of the mortality returns for 1900 were derived from or corrected by the enumerators' schedules, or perhaps to an actually larger number of unemployed for the year 1908. The deaths of females aged 10 years or over are nearly twice as many as those previously compiled, but the ratio of deaths of employed females to the total deaths shows a similar decrease (13.3 per cent to 11.7 per cent).

Although the volume of the returns is thus considerably greater than for the last compilation of occupational mortality statistics, one of the two essential factors is wanting to the production of definitive mortality rates by occupations. The population, by occupations, can not be estimated for a year so remote from the date of the last general census. It is not practicable to estimate even the total number employed in each occupation, much less their distribution by periods of age. In fact, it has seemed unwise to attempt to estimate even the sex and age distribution of the general population; all census estimates have been confined to total population, and employed solely for the purpose of temporary computations of crude death rates, which will be duly corrected as soon as the returns for the next census are available.

If, then, it is impossible to compute accurate rates of occupational mortality on the basis of the data obtainable, it may be asked whether it is worth while to present the figures contained in the present bulletin. The answer is that such figures of relative mortality,

although based solely upon the returns of deaths, afford much information of practical sanitary value, which may be safely used as a guide to the prevention of excessive ratios of mortality in certain occupations from various diseases, e. g., tuberculosis, or from accidents. They are frequently suggestive and point the way to more conclusive investigations. Moreover, at the present moment, when a concerted effort is to be made by sanitary and statistical authorities and by the organized medical profession to improve the quality of registration returns of deaths with respect to the statement of the occupations of decedents, it is desirable to have a compilation for a recent year prior to the attempt at improvement, to serve as a basis for measurement of the results obtained.

CLASSIFICATION OF OCCUPATIONS.

Another and even more cogent reason for the present compilation of causes of death and occupations is the use that may be made of the data for the purpose of determining a more satisfactory classification of occupations for the presentation of mortality statistics. The classification employed in this bulletin is the same as that under which the statistics of occupations in relation to deaths were presented for 1900. It consists of 8 general classes and 66 individual titles for males, and 14 individual titles for females, not including the terminal "all other occupations" for each sex. The titles are intended to correspond as closely as possible to fairly well-defined specific occupations, just as the titles in the tabular list of causes of death are intended to represent definite diseases. The introduction of the 8 general classes necessitated 6 residual titles, under which "others of this class" are included. They have no specific value, and, like the residual titles of the list of causes of death, may be neglected for statistical study, since they do not relate to any definite occupation. There are in reality therefore only 60 distinct occupations in the statistical classification that has been employed by the Census for mortality statistics of males. This number may seem small, but it should be recalled that in the Supplements relating to occupational mortality prepared by the Registrar-General's Office of England and Wales—our great source of exact information relating to this subject—there were, for the compilation of 1890 to 1892, only 100 separate occupations; and the last compilation, for 1900 to 1902, adds only some 15 additional titles. The English reports relate solely to the occupations of males, because, in the judgment of the compilers, the material was so incomplete as to be practically worthless for the occupations of females.

These facts show the difficulty of preparing a satisfactory list of individual occupations for the study of occupational mortality. Although the English

census presents data relative to nearly 400 occupations, it was possible to give the mortality statistics of occupations for only about 100, and for some of these the returns of deaths are too few to give a reliable basis for mortality rates. In a similar way the condensed list of occupations employed for mortality statistics by the United States Bureau of the Census in 1900 and in the present bulletin for 1908 may be compared with the more extended list of 303 occupations employed for the analysis of the occupations of the population.¹ Many of the individual occupations found in the population census would not be returned upon certificates of death, so that the direct comparison of the population and mortality returns would be impracticable in some cases. Both the condensed mortality classification of occupations (60 titles) and the more extended population classification (303 titles) are in reality reduced from the much more extensive list of individual terms designating occupations, just as the titles of the tabular list of causes of death in the International Classification include many individual names of diseases which are not separately stated in the statistical tables.

What is needed, both for the mortality statistics and for the population statistics, is a list containing all the more important individual occupations, and with an exact statement of the terms included under each of its titles. Such a list is being prepared by the Bureau of the Census, based on the terms employed by the census enumerators in 1900 in reporting the occupations of the general population. For the purpose of securing a satisfactory adjustment of this list to the requirements of mortality statistics a recent compilation of the occupations reported on the certificates of death is necessary. Such a compilation will, moreover, furnish a means of determining the comparative value for mortality statistics of the old and the new classifications of occupations. For this reason the occupations of decedents returned for the year 1908 have been compiled according to the classification employed for mortality statistics in 1900, and for 1909 a similar compilation will be made in accordance with the full classification (303 titles) made use of for 1900 in the population report on occupations. Direct comparisons can thus be made of the value of the two systems, and with the suggestions resulting from the comprehensive study of the constituent terms of the population returns, it is hoped that a more complete and satisfactory classification, or rather *list* of specific occupations, can be prepared for the use of the Thirteenth Census in its reports upon the population of the United States by occupations for 1910, and also for the compilation of the mortality statistics of occupations beginning with the same year. It is true of all "classifications" of occupations,

as it is of those of causes of death, that the *classification* in its ordinary sense of constituting more or less theoretical groups of related titles is of no practical consequence. What is demanded for practical use is the establishment and exact definition, by the full statement of included terms, of a standard list of specific occupations, concerning which the wayfaring man, as well as the expert statistician, is informed. The occupations listed should be sufficiently numerous and distinctive in character, conditions of employment, environment, and other factors of a remediable or avoidable nature, so that exact knowledge of their effect in injuring health and causing death may lead to practical sanitary improvement.²

It need not be said, therefore, that the classification of occupations employed in this bulletin is not especially commended. Certain titles are fairly definite, while others are too comprehensive and include very dissimilar employments. By the aid of criticism, in connection with the more detailed classification that will be shown for the following year (1909), a far more satisfactory list of occupations can be devised for use, beginning with the compilation for 1910.

RELATIVE MORTALITY OF OCCUPATIONS FROM CERTAIN CAUSES.

The total number of deaths of occupied persons compiled for the year 1908 is shown for males in Table 6 and for females in Table 7, by periods of age, and for certain important causes of death. The more extended list of causes of death, which will be used in the annual report, is presented in the following table, which shows for each cause and each sex the total number of deaths and the number and per cent formed of such deaths by the employed.

The relative importance of different diseases in occupational mortality is largely affected by differences in age distribution. This is roughly indicated by comparison of the average and median ages at death for a few causes. Thus, without distinction of sex, the average age at death of persons dying of typhoid fever in the registration area was, for 1906, 28.2 years and the median age was 25.5 years; the average and median ages of decedents from tuberculosis of the lungs were 35.5 and 33.3 years, respectively; from cancer, 58.5 and 59.4 years; from apoplexy, 63.6 and 66.8 years; from paralysis, 67.6 and 71.1 years; from heart disease, 58.8 and 63.2 years; from bronchopneumonia, 16.2 and 1.4 years; from pneumonia (lobar and unqualified), 35.5 and 36.7 years; from Bright's disease, 56.5 and 59.3 years; from suicide, 43.5 and 42.2 years; and from total violence, 34.7 and 33 years. The average age is obtained by multiplying the number of deaths at each age by that age and dividing the sum of the resulting products by

² See papers by the chief statisticians of the Bureau of the Census for population and vital statistics in the quarterly publications of the American Statistical Association, June, 1909.

¹ Occupations at the Twelfth Census, 1904.

the total number of deaths. The median age is that age at which the decedents are equally divided, one-half being older than the median and the other half younger. Where the incidence of a disease is fairly uniform throughout life the average and median ages approximately agree, but where the deaths are concentrated in the earlier ages, as is the case of bronchopneumonia, there may be wide divergence. The great economic value of life-saving from tuberculosis of the lungs is indicated by the fact that of all deaths of males from tuberculosis, 77.3 were deaths of males gainfully employed, whereas in the case of deaths of males from all causes only 52.3 per cent were of those so employed. For females the corresponding percentages are 18.8 and 8.3, respectively.

CAUSE OF DEATH.	DEATHS IN THE REGISTRATION AREA: 1908.					
	Male.			Female.		
	Total.	Occupation stated. ¹		Total.	Occupation stated. ¹	
		Number.	Per cent.		Number.	Per cent.
All causes.....	375,497	196,207	52.3	316,077	26,205	8.3
Typhoid fever.....	6,763	4,993	73.8	4,612	808	17.5
Tuberculosis of lungs.....	38,055	29,433	77.3	29,321	5,511	18.8
Cancer.....	13,046	10,091	77.3	20,419	1,970	9.6
Rheumatism.....	1,771	1,074	60.6	1,770	187	10.6
Diabetes.....	2,988	2,149	71.9	3,285	281	8.6
Alcoholism.....	2,084	1,760	85.4	264	67	25.4
Lead poisoning.....	89	81	91.0	6		
Other occupational and chronic poisonings.....	119	92	77.3	105	23	21.9
Apoplexy and paralysis.....	20,244	13,938	68.9	19,767	1,527	7.7
Other diseases of nervous system.....	17,825	5,108	28.7	13,254	661	5.0
Heart disease.....	31,518	22,573	71.6	28,520	2,637	9.2
Other diseases of circulatory system.....	11,406	7,459	65.4	9,163	756	8.3
Bronchitis.....	5,922	1,811	30.6	6,210	294	3.6
Pneumonia (all forms).....	33,645	15,023	44.7	27,614	1,835	6.6
Pleurisy.....	1,105	701	63.4	743	88	11.8
Asthma.....	705	491	69.6	608	60	9.9
Other diseases of respiratory system.....	2,895	1,411	48.7	2,311	162	7.0
Cirrhosis of liver.....	4,488	3,616	80.6	2,221	218	9.8
Other diseases of liver.....	1,783	1,287	72.2	2,438	212	8.7
Peritonitis.....	1,206	685	56.8	1,772	244	13.8
Appendicitis.....	3,140	2,093	66.7	2,149	343	16.0
Hernia.....	985	639	64.9	932	109	11.7
Other diseases of digestive system.....	36,169	5,478	15.1	32,410	860	2.7
Bright's disease.....	22,222	16,277	73.2	16,981	1,836	10.8
Childbirth.....				7,344	731	10.0
Suicide.....	6,429	5,380	83.7	1,903	454	23.9
Poisonous gases, other accidental poisonings.....	2,057	1,264	61.4	1,283	173	13.5
Other accidents and injuries.....	31,734	19,287	60.8	9,015	683	7.6
All other and unknown causes.....	75,154	21,993	29.3	69,656	3,545	5.1

¹Exclusive of deaths of children under 10 years of age.

For the purpose of this bulletin only the following causes of death, each of which (except typhoid fever) was responsible for at least 5,000 deaths of male breadwinners during the year, are shown in Tables 6 and 7: Typhoid fever, tuberculosis of lungs, cancer, apoplexy and paralysis, heart disease, pneumonia (all forms),¹ Bright's disease, suicide, other violence.

The total number of deaths from these causes of persons reported as having occupations is, for males, 138,259, and for females, 17,434, or 70.5 per cent and 66.5 per cent, respectively, of the total deaths of each sex for which occupations were stated.

¹Chiefly lobar and unqualified, not bronchopneumonia.

The number of deaths of female breadwinners from each of the specified causes except tuberculosis of the lungs is so small that anything but the most guarded use of the figures is likely to lead to some of the well-known statistical fallacies attendant upon the use of small numbers. When a few deaths are subdivided by occupations and age groups, some of the subdivisions will contain only a few deaths, and the addition of a single death might very appreciably affect any ratio based upon such a group. As the numbers increase in magnitude the probability of such merely accidental fluctuations becomes less. It is for this reason that only the causes to which were due the largest numbers of deaths are considered in this bulletin, and that occupations for which less than 1,000 deaths were returned for the year are dropped from the list of occupations. The occupations discarded for the present purpose, but which will appear in the annual report, are, with the number of deaths for 1908, as follows:

Males.

Architects, artists, and teachers of art, etc.....	491
Journalists.....	304
Musicians and teachers of music.....	605
Teachers (school).....	567
Apothecaries, pharmacists, etc.....	308
Commercial travelers.....	482
Hucksters and peddlers.....	784
Hotel and boarding-house keepers.....	723
Janitors and sextons.....	925
Soldiers, sailors, and marines (United States).....	304
Brewers, distillers, and rectifiers.....	293
Cabinetmakers and upholsterers.....	917
Cigar makers and tobacco workers.....	975
Clock and watch repairers, jewelers, etc.....	346
Coopers.....	492
Glass blowers and glass workers.....	414
Hat and cap makers.....	333
Leather makers.....	397
Leather workers.....	492
Marble and stone cutters.....	835
Millers (flour and grist).....	333
Plasterers and whitewashers.....	499
Tinners and tinware makers.....	519
Boatmen and canalmen.....	227
Livery-stable keepers and hostlers.....	853
Lumbermen and raftsmen.....	717
Stock raisers, herders, and drovers.....	784

Females.

Musicians and teachers of music.....	197
Stenographers and typewriters.....	389
Hotel and boarding-house keepers.....	106
Nurses and midwives.....	874
Artificial-flower and paper-box makers.....	43
Cigar makers and tobacco workers.....	159
Mill and factory operatives (textiles).....	783
Milliners.....	301
Telegraph and telephone operators.....	179

The exclusion of the occupations given above leaves 33 individual occupations for men, to which are added the 8 class totals; and only 5 individual occupations for women. It must be concluded that the statistics

of occupational mortality of women, as derived from general registration returns, are too scanty to be of special value, and hence the tables relating to the deaths of occupied females will merely be appended as supplementary to the corresponding tables for deaths of occupied males, and will not be given special discussion in this bulletin.

Examination of Table 6 or the text table with ratios on page 18 will show that the majority of deaths of occupied males occur at the period of life between 25 and 64 years, and that only at those ages and at the ages 20 to 24 years are more than 80 per cent of all males dying reported as having an occupation. The age period 65 years and over is too long to be properly brought into this comparison, and moreover includes many persons not in reality actively employed at the time of death or at the beginning of the illness which caused death. This age period will be subdivided in the next report into the periods 65 to 74, 75 to 84, and 85 years and over, which will enable the study of the effects of occupations to be carried to more advanced ages, and the question of the reporting of the occupations of persons retired from their callings will be considered. In the meantime the great bulk of the active business of life may be considered to be carried on by men from 25 to 64 years of age, and hence the four ten-year periods of life, 25 to 34, 35 to 44, 45 to 54, and 55 to 64, are selected for special study in Tables 6 to 11 in this bulletin relating to occupations. For each of these periods about 30,000 deaths of occupied males occurred, many more than for the period 20 to 24 years. Moreover, the effects of certain occupations would not begin to be definitely shown until the workers had been subjected to them for a considerable time. Hence a better idea of the relation of occupations to causes of death may be obtained from a consideration of the ages 25 to 64 than from a consideration of the entire period 15 to 64. For females, however, the earlier ages will be given special consideration in the report, because breadwinners form a much larger proportion of the female decedents aged 15 to 24 years than of the female decedents in any other age period.

Table 6 shows for males, and Table 7 for females, the number of deaths in each occupation having not less than 1,000 deaths during 1908 from each cause responsible for not less than 5,000 deaths of occupied males during the year (typhoid fever, 4,993), by the four successive ten-year age periods comprising the principal working life of men, namely, 25 to 34 years, 35 to 44 years, 45 to 54 years, and 55 to 64 years. Again, for certain occupations, the difficulty of small numbers comes in and therefore, when for any occupation the total number of deaths in one of the age periods presented falls below 200, the numbers and percentages given for that occupation in that age period are, as a warning, printed in italics. Italic figures, therefore,

indicate that the basic returns are small in number, and that the statistics are subject to aberrations and can only be depended upon when they are consistent in their indications and harmonize with similar data.¹

Table 6 includes, in addition to the actual number of deaths of occupied males described above, the per cent which the deaths from each cause bear to the aggregate deaths from all causes, classified according to the age and occupation of the decedent. Thus it appears that out of the 196,207 deaths of occupied males at all ages, 29,433, or 15 per cent, were due to tuberculosis of the lungs. This cause was responsible for 8,446, or 30.9 per cent, of the total deaths of male breadwinners dying at the ages of 25 to 34 (27,366); for 7,453, or 24.3 per cent, of the total at the ages of 35 to 44 (30,632); for 4,770, or 14.4 per cent, of the total at the ages of 45 to 54 (33,192); and for only 2,524, or 7.6 per cent, of the total at the ages of 55 to 64 (33,301). It would seem, upon superficial examination, that the mortality from tuberculosis of the lungs rapidly decreases with advancing life, inasmuch as, while the total number of deaths continues to increase, the deaths from this disease show a marked decline in number and consequently in the percentage of deaths from all causes. But owing to the facts that the population decreases as the older age periods are reached, and also that the mortality caused by other diseases assumes greater importance with advancing years, the true incidence of tuberculosis of the lungs as measured by the number of deaths per 100,000 of population exposed at each age period may remain stationary or even increase, while the actual numbers of deaths and the proportional mortality (percentage of deaths from all causes) may show a decline. This is clearly shown in the following table, comparing the deaths from consumption and phthisis, terms equivalent to tuberculosis of the lungs, with the percentages of all causes and the specific death rates at each age period:

MALES.	AGE PERIODS.				
	All ages.	25 to 34 years.	35 to 44 years.	45 to 54 years.	55 to 64 years.
United States, 1900: ¹					
Population	6,937,288	1,541,280	1,238,393	841,800	538,704
Consumption	15,690	4,616	3,507	2,194	1,330
Per cent of total	100.0	29.4	22.4	13.8	8.5
Death rate	226.2	299.5	283.2	257.1	246.9
England and Wales (1900 to 1902): ²					
Years of life (all males)	31,389,867	7,457,862	5,795,829	4,188,627	2,723,835
Phthisis (all males)	66,937	16,096	16,725	13,183	6,876
Per cent of total	100.0	24.0	25.0	19.7	10.3
Death rate	213.2	215.8	288.6	314.7	252.4
Years of life (occupied males)	29,519,574	7,337,565	5,668,233	4,024,074	2,424,456
Phthisis (occupied males)	58,463	14,913	15,550	12,235	5,241
Per cent of total	100.0	25.5	26.6	20.9	9.0
Death rate	198.0	203.2	274.3	304.0	216.2

¹Population and deaths for registration states only; 10 years and over.

²Occupations for triennium 1900 to 1902 compared with population of 1901 multiplied by 3, thus giving the *years of life*: 15 years and over.

¹For different use of italics in the English data, see note on Table 12.

In the registration states during the census year 1900, as is shown in the above table, 29.4 per cent of the deaths from consumption among males 10 years of age and over occurred in the age period 25 to 34 years, while only 8.5 per cent occurred in the age period 55 to 64 years; but the specific death rates for these two ages were far more nearly the same—299.5 and 246.9 per 100,000 of population, respectively. In England and Wales the per cent of the total deaths from phthisis among occupied males at least 15 years of age formed by those occurring in the age period 25 to 34 (25.5) was greater than the per cent formed by those in the age period 45 to 54 (20.9), yet notwithstanding this fact the death rate per 100,000 of population rose from 203.2 in the former period to 304 in the latter. Hence the greatest caution must be exercised in the use of Tables 6 to 11, and emphasis must be placed upon a thorough understanding of just what they do and do not mean and for what they may and may not be used:

Tables 6 to 11 contain no death rates or mortality figures for any occupation based upon the total number of persons employed in that occupation, and hence they must not be compared directly with occupational death rates or with mortality figures showing the relations of deaths to the population in which the deaths occurred.

Tables 6 to 11 show only the relative importance of the several causes of death as compared with all other causes combined at each of the specified age periods for each occupation; the relative importance of a given cause varies inversely with the aggregate of all the other causes, and if an occupation is subject to unusually high mortality from a given disease, it will depress the ratio (per cent) of every other.

Nevertheless, Table 6 conclusively shows some facts of great importance for practical sanitary purposes with reference to the relative numbers of deaths from the causes indicated at the several age periods. It is a fact, for example, that in the registration area of the United States during the year 1908, 30.9 deaths out of every 100 deaths of occupied males who died between the ages of 25 and 34 years were caused by tuberculosis of the lungs, or nearly 1 death out of every 3. It is a fact that in the age period 25 to 34 years 41.9 deaths out of every 100 deaths of bookkeepers, clerks, and copyists were from this cause; and that 40.1 per cent of the barbers and hairdressers, 40.9 per cent of the servants, 44.1 per cent of the boot and shoe makers, 49.2 per cent of the compositors, printers, and pressmen, 41.2 per cent of the tailors who died during this age period succumbed to pulmonary tuberculosis as compared with only 25.6 per cent for farmers and 5.3 per cent for miners and quarrymen. It does not follow that the death rate from tuberculosis of the lungs is in reality lower among miners and quarrymen, for example, than among printers. The very high ratio of deaths from accidents (62.1 per cent) of miners and quarrymen

would greatly reduce the *relative* importance, but not necessarily the absolute death rate, of tuberculosis for this occupation, as compared with the printers, who have only a low ratio (7.3 per cent) from external causes. It is not necessary to compare the true death rates of the various occupations from tuberculosis of the lungs to perceive the immense saving of valuable lives that would result from the prevention of tuberculosis. It is shown conclusively that for the great majority of occupations given at the younger ages, the prevention of tuberculosis is of far greater importance than the prevention of any other cause of death.

Having clearly in mind the fact that all that Table 6 attempts to do is to show the relative importance of the nine principal causes of death at each age period, it may be permissible to state the ratios there shown for each occupation in their relation to the average ratios for all specified occupations, the latter being taken as 100 per cent. Table 8 presents these derived percentages for males, and Table 9 shows similar percentages for the primary ratios for females given in Table 7. They may be read as indicating that the relative importance of tuberculosis of the lungs as a cause of death among the bookkeepers, clerks, and copyists who died in the registration area during 1908 between the ages of 25 and 34 years (41.9 per cent) was 35.6 per cent in excess of the relative importance of that disease as a cause of death among all occupied males at the same age period (30.9 per cent), this relation being expressed by the index number 135.6. During the next two decades of life, the proportions of deaths from pulmonary tuberculosis among bookkeepers, clerks, and copyists are still higher (29.6 per cent for age period 35 to 44, 16.5 per cent for age period 45 to 54) than those for any of the other causes shown, and exceed by 21.8 per cent and 14.6 per cent, respectively, the ratios of all occupied males from this disease. For the last decade, however, 55 to 64 years, only 6.9 per cent of the bookkeepers, clerks, and copyists who die perish from tuberculosis of the lungs; other causes, such as cancer (9 per cent), apoplexy and paralysis (11.1 per cent), heart disease (15.4 per cent), and Bright's disease (14.7 per cent), are more to be feared by this class of workers at that age.

For convenience of comparison the information given in Tables 8 and 9 in regard to the relative importance of the various diseases for each occupation may be arranged in tabular form with the occupations showing the greatest relative importance at the head. This is done for males in Table 10 and for females in Table 11, although the very few occupations for which even a fairly complete compilation can be made for women workers renders the latter of little value. As of special interest in this connection, and for the purpose of supplying a corrective comparison based upon actual death rates of persons occupied and population,

Table 12 has been added from the Supplement upon occupations recently published by the Registrar-General of England and Wales, and gives the highest and lowest mortality figures, as carefully elaborated by Doctor Tatham, for four important causes of death—phthisis (tuberculosis of the lungs), pneumonia, suicide, and accident. These mortality figures are based upon the English census of 1901 and the registration returns for the three years 1900 to 1902, and thus give a sufficient number of deaths for some of the smaller occupations; while they include all age periods, instead of stating separately the relative importance at successive decades, they are corrected for the differences in age distribution. Many of the occupations differ in their designations and nature from those found in this country, yet some interesting and important correspondences in the figures will be noted.

Thus in Table 10 compositors, printers, and pressmen are at the top of the list of relative proportions of deaths from tuberculosis of the lungs during the ages 35 to 44 years, second from 45 to 54 years, and fairly high, but with a small numerical basis of deaths, for the last period, 55 to 64 years. The English mortality figure for phthisis among printers is 290 as compared with 175 for all occupied males.

Again, servants show high ratios from tuberculosis in Table 10, and the laboring and servant class exceeds any other during the last two decades, 45 to 64 years. In the English statistics of Table 12 it is noticeable that the same occupations appear with high mortality figures: Inn (hotel) servant (London), 669; general laborer (industrial districts), 567; inn (hotel) servant (entire country), 533; general laborer (London), 531; general laborer (entire country), 450; innkeeper, servant, etc., in London, 443; inn (hotel) servant (industrial districts), 426; inn (hotel) servant (agricultural districts), 410; innkeeper, servant, etc., (entire country), 306; dock laborer, wharf laborer, 291; innkeeper, servant, etc., in agricultural districts, 288. With us, however, the class of "public entertainment" is consistently below the average, except for the first decade, 25 to 34 years.

In respect to tuberculosis, clergymen are at the bottom of the English list and also of the American for the only decade, 55 to 64 years, in which as many as 200 deaths occurred of this profession during 1908. According to the English figures the calling of the minister is the healthiest of all occupations, except that of the farmer, grazier, etc., in agricultural districts, the English mortality figure from all causes being only 515 for ministers as compared with 925 for all occupied males, and 2,471 for general laborers. Nevertheless, as the American figures show, subject to correction for insufficient returns, clergymen die more frequently from tuberculosis of the lungs than from other causes, as compared with the average of occupied persons, at the ages 25 to 34 years and 45 to 54 years, although somewhat less frequently at the ages 35 to 44 years.

Again, miners and quarrymen, who are unfortunately associated in a single title, are low in respect to tuberculosis in the American figures up to 55 years, then nearly at the top of the list. Miners appear to have a real immunity from tuberculosis, according to the English figures for all ages, and the sudden rise at 55 years may be due to the cessation of this arduous occupation with advancing years.

Physicians and surgeons are below the average as to tuberculosis in each decade in the United States, and at the bottom or next to the bottom of the list between the ages of 35 and 54 years; the English mortality figure, which includes retired as well as occupied medical men, is only 65, or fourth from the lowest figure given.

These are more than coincidences, and show that the ratios of comparative mortality are fairly trustworthy for many purposes, and are always suggestive; care only should be taken that they are not used for more than their special purpose, that of showing the *relative* importance of the various diseases as compared with all other causes. The proviso "other things being equal," that is, that there is no excessive mortality from other causes to disturb the ratios, should always be borne in mind in using them. For this reason no attempt has been made to present ratios for occupations at all ages, which might readily be misused; when the figures are limited to a specific age period, the individual who makes reference to them is much more likely to examine the full heading of the table and to note the limitations under which they are presented.

IMPROVEMENT OF STATEMENT OF OCCUPATION.

If information of the highest value concerning the effects of occupations upon mortality is to be obtained, greater attention must be given to a precise statement of the occupation, and the provisions upon the forms used for the registration of deaths must be such that the unskilled informant, whether a relative, an undertaker, or a physician, will be led to give adequate information in regard to the true nature of the occupation of the decedent. Unlike the question of cause of death, for which a great variety of forms has been in use in the United States, the question of occupation has almost without exception been put in the simplest way, merely the word "occupation" being used, with no explanation or instruction and no suggestions or examples of how a blank should be filled out in this respect. As an example, the form of the question upon the standard certificate of death, which has been in use by the Bureau of the Census and by many registration states and cities since 1902, is represented below:

OCCUPATION

At the first meeting of the registration officials of the United States, organized as the Section on Vital Statistics of the American Public Health Association, at Atlantic City, October, 1907, some suggestions in regard to the proper statement of occupation upon certificates of death were submitted for consideration. These were printed in the proceedings¹ of the section, and thus have been brought to the attention of registration officials and statisticians throughout the country. They are as follows:

1. An attempt should be made to secure not only the kind of occupation (e. g., laborer), but also the kind of industry (e. g., pottery).

2. For satisfactory statistics of occupational mortality, it is desirable to know the length of time employed from beginning the occupation until death.

3. In case of a recent change of occupation (——² years before death) it is desirable to know the previous occupation, which may have been the cause of change to a lighter employment and the predisposing cause of death.

4. For persons unemployed it may be important to know the last previous employment (——² years before death), as this may have contributed to invalidism or retirement, and may have been a contributing cause of death.

5. Instructions in regard to the reporting of occupations should be uniform in population, industrial and mortality schedules (certificates of death), and uniform instructions should be prepared for physicians and local registrars and enforced by state registration offices, on this basis.

6. Occupations should be stated for all decedents over ten years of age (and for decedents under ten years of age if employed in a mill, factory, or in any gainful occupation).

7. For children under ten years of age the occupation of the father (or of mother, if not supported by father) should be obtained on account of the great value of such information for a proper study of infant and child mortality.

The following form and note are submitted for criticism:

OCCUPATION (Last gainful occupation; if under 10 years, that of FATHER.)	
(Kind of work? Trade? Profession?)	From
	To
	(Years only.)
(Employed in what kind of business, mill, factory? On farm, railroad, etc.)	

NOTE.—If deceased has been employed in above occupation for less than ——² years, please fill out statement of LAST PREVIOUS OCCUPATION on reverse side. The complete and correct statement of occupation is most important, and informants, or physicians, are requested to make a precise statement. Local registrars should see that the blank is properly filled out in this respect.

The recommendations were referred to a special committee on occupations, which, however, made no report at the meeting in the subsequent year at Winnipeg. Nevertheless the section considered the propositions submitted and adopted two of them, Nos. 1 and 6, which, under the constitution of the section, became definite Rules of Statistical Practice of the American Public Health Association.³ It seemed wise to defer consideration of the other sug-

gestions until the meeting to be held at Richmond, Va., October 19 to 22, 1909.

In the meantime it became evident that a revision of the standard certificate of death was necessary in order that the new form could be adopted and put into effect throughout the United States with the beginning of the calendar year, January 1, 1910. As the statement of occupation forms an important part of this blank, the Bureau of the Census prepared and sent to registration officials some forms, of which the following met with general approval, and would undoubtedly be successful in securing the full statement of occupation and the special statement of industry as well when the additional information is essential for the proper definition of the occupation:

OCCUPATION
(a) Trade, profession, or special employment,
(b) Business or industry in which employed,

After the preparation of this original draft of a revised form of statement, a conference was held in regard to the final form of these questions upon the population schedule to be employed for the Thirteenth Census. The questions corresponding to those upon the proposed standard certificate were worded as follows:

Column 19.—Trade or profession of, or particular kind of work done by, this person, as *spinner, salesman, laborer, etc.*

Column 20.—General nature of industry, business, or establishment in which this person works, as *cotton mill, dry goods store, farm, etc.*

Column 21.—Whether an employer, employee, or working on own account.

As there is no particular difference between the above form and the original draft for the revised standard certificate, it is suggested that the latter be modified so that it will correspond exactly:

OCCUPATION
(a) Trade, profession, or particular kind of work,
(b) General nature of industry, business, or establishment in which employed (or employer?)

Agreement in the general use of this form will permit the carrying out of the recommendation that instructions for the reporting of occupations should be uniform in the population and in the mortality schedules. As an example of minimum instructions prepared for this purpose, which could be printed upon the back of every standard certificate of death used in the United States, the following is submitted:

Statement of occupation.—Precise statement of occupation is very important, so that the relative healthfulness of various pursuits can be known. For many occupations a single word or term on the first line will be sufficient, e. g., Farmer, Physician, Stenographer, Composer, Architect, Locomotive engineer, Civil engineer, Stationary fireman, etc. But in many cases, especially in industrial employments, it is necessary to know (a) the kind of work and also (b) the nature of the business or industry, and therefore an additional line

¹ Quarterly Publications of the American Statistical Association, December, 1907, page 525.

² Time limit to be determined.

³ Mortality Statistics, 1907, page 489.

is provided for the latter statement; it should be used only when needed. As examples: (a) Spinner—(b) Cotton mill; (a) Salesman—(b) Grocery; (a) Foreman—(b) Automobile factory. The material worked on may form part of the second statement. Never return "Laborer," "Foreman," "Manager," "Dealer," etc., without more precise specification, as "Day laborer," "Farm laborer," "Laborer—Coal mine," etc. Women at home, without gainful employment, may be entered as "Housewife" or "At home," and children, not gainfully employed, as "At school" or "At home." If the occupation has been changed or given up on account of the DISEASE CAUSING DEATH, state occupation at beginning of illness. If retired from business, that fact may be indicated thus: "Farmer (retired, 6 yrs.)."

The use of uniform questions for the statement of occupation and identical instructions in connection therewith will add greatly to the value of the returns of the occupations of persons living and of persons deceased, and should mark the beginning of progressive improvement in the mortality statistics of occupations for this country. It is not necessarily implied that the occupational mortality should be stated by

industries in the statistical reports. The kind of work that a man performs—his trade, profession, or particular kind of employment as related to the individual—may be more important than the massing of mixed occupations under great industries. The vital statistics are of the greatest benefit for individual workers and classes of workers, and the trade, or particular kind of labor that a man performs, is of the greatest interest in this connection. In order that the kind of labor that a man performs should be definitely known, however, it is frequently necessary that the industry or business in which he is engaged should be known as well as the particular occupation in the narrow sense. Hence the provision for the general statement of industry, business, or establishment in which employed, in order to define the real nature of the decedent's occupation, which, in the absence of this information, might be too indefinite for satisfactory compilation.

SECOND DECENNIAL REVISION OF THE INTERNATIONAL CLASSIFICATION OF CAUSES OF DEATH.

The statistical classification of causes of death is a matter of fundamental importance to every registration office. Upon the uniformity and precision with which the multitudinous terms designating the causes of death as reported by physicians are assigned to the necessarily limited list of titles of the formal statistical classification, depend, to a very great degree, the accuracy and usefulness of the mortality statistics. All compilation of causes of death should be made by trained experts, according to definite rules, and under constant medical supervision, so that the necessary inquiries can be made of the reporting physicians in regard to indefinite or ambiguous statements upon certificates of death, and that more complete and correct information can be obtained when necessary to define the true cause of death.

It is evident that much of the value of the statistical tables relating to causes of death will be lost if they are not fully available for comparative purposes. A universal statistical classification of causes of death that should be used by every city, state, and country in the world that publishes mortality reports has been the hope of vital statisticians for many years. This end has not yet been attained, although there is a greater degree of correspondence between all of the national methods of classification at present than in times past, and a large number of the nations of the world have united in the use of an absolutely identical system known as the "International Classification of Causes of Death and Sickness," the second decennial revision of which has just taken place, under the auspices of the French Government, at Paris, July 1 to 3, 1909.

The Bureau of the Census was one of the first national offices in the world to employ the International

Classification for the compilation of a vast mass of statistics, the returns of deaths from the registration area of the United States for the *calendar* year 1900. Although the registration area does not extend over the entire territory of continental United States, it represented at that time a population of 30,765,618, or 40.5 per cent of the total population of the country, and the deaths compiled numbered 539,939 for the year, or more than those compiled in any other national office of the world except England and Wales (587,830), Russia (3,055,030), Germany (1,236,382), Austria (658,680), France (853,285), Italy (768,917), and Japan (914,557). All these countries have complete national registration of vital statistics. The First Decennial Revision, which was held at Paris in August, 1900, and which did not go into effect as a rule until employed for the statistics of 1901, was thus used by the Bureau of the Census for the year of revision (1900), and has been employed in the series of annual reports that began with that year, displacing the old census classification that was employed for the mortality statistics of the Twelfth Census (year ending May 31, 1900). It will be used for the next report, that for the calendar year 1909, but for the extremely important data of 1910, which will be directly comparable with the population as enumerated by the Thirteenth Census as of date April 15, 1910, the new and greatly improved Second Decennial Revision of 1909 will be employed. For that year, with possibly 60 per cent of the total population of the United States represented, the number of deaths will probably exceed those of any other national offices except those of Russia, Germany, France, and Japan. This is a vast mass of statistics, which would be truly national in character ex-

cept for the fact that the South has as yet no effective state registration.

The possibility of having the newly revised classification available for the use of the United States at the beginning of the census decade 1910 to 1919, and for the extremely important comparisons of mortality and population data for the calendar year corresponding to the approaching census of population, was brought about by requests addressed by the Bureau of the Census in 1906 to the registration authorities of the various countries that participated in the first revision, with the cordial approval of Dr. Jacques Bertillon, secretary-general of the international commission, and the acquiescence of the French foreign office. Otherwise the revision would not have occurred until 1910, and the mortality statistics of the census year would have had to be compiled according to a system soon to be discarded. As it is, the new revision is available when most needed by the United States, and the registration states and cities of this country, as well as the Federal Government, are greatly indebted to the courteous compliance of the other countries with the desire expressed for an earlier date of revision. The purpose of the decennial revision, as expressed in the original propositions therefor made by the American Public Health Association in 1898 and indorsed by the International Statistical Institute in 1899, is that the classification can be kept abreast of the constantly advancing knowledge of pathology, so that the sanitarian and physician who desires to consult the official statistics of causes of death will not be obliged to employ obsolete and discarded medical terms. For the same reason the Nomenclature of Diseases of the Royal College of Physicians of London has been revised every ten years since 1869, and the American Medical Association, through its committee on nomenclature, is planning a similar authoritative work for this country, which will likewise need to be kept up to date by periodical revisions.

REPORT OF THE CENSUS COMMISSION.

The Bureau of the Census, by its division of vital statistics, is the national registration office of the United States. It receives transcripts of the original certificates of death from all the registration states and cities and compiles the only general mortality statistics of the country. It is therefore particularly concerned in the representation of the United States in the International Commission of Revision, upon whose decisions depend the methods of compilation and presentation of the annual reports on mortality statistics for the next ten years. It has recognized, moreover, that the state and city registration officials are equally interested with the Bureau of the Census in the work of revision, because all of them (with the exception of those of a few cities) employ the International Classification in their annual reports and their weekly or monthly

bulletins of mortality. It is hoped that all cities will use the revised classification of 1909, instead of employing some local method that has no value for general comparisons, and is frequently very imperfect or even ridiculous in its arrangement. The special interest of the medical profession has also been enlisted, because upon the general approval by the physicians of the country of the forms of statistical presentation of causes of death must depend much of the usefulness of mortality reports. Moreover, the physicians of the country can not be expected to follow detailed instructions in regard to the proper reporting of the causes of death upon the certificates of death which they make out, when such instructions are based upon a system of classification and nomenclature of diseases which they had no part in framing, and of which they may not fully approve.

It is for these reasons that the Bureau of the Census has sought the cooperation of the organized registration officials and of the medical profession of the United States in the work of preparing recommendations for the revision of the statistical classification of causes of death, and for the broader and more difficult task of building up an authoritative nomenclature of diseases for the United States. The text of the last annual report, *Mortality Statistics, 1907*, shows how generously and cordially the official registrars and the committees of the American Medical Association and many other national medical organizations have cooperated for what will ultimately result in the fundamental improvement of the entire mortality statistics of the United States, and therefore, in the increased efficiency of all its sanitary agencies, national, state, and municipal.

It is especially gratifying that the Congress of the United States recognized the importance of this work and the value of the assistance of the registration officials and the medical profession in building up better mortality statistics for the United States, and made special provision for the adequate representation of the registration service of the country in the Second Decennial Commission of Revision. The paragraph relating thereto is given below, together with the full text of the law (Public—No. 1) passed at the recent special session:

SIXTY-FIRST CONGRESS OF THE UNITED STATES OF AMERICA;

At the First Session,

Begun and held at the City of Washington on Monday, the fifteenth day of March, one thousand nine hundred and nine.

[PUBLIC—No. 1.]

[H. R. 10933.]

An Act Making appropriations for expenses of the Thirteenth Decennial Census, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby appropriated, out of any money in the Treasury not otherwise appro-

priated, for salaries and necessary expenses for preparing for, taking, compiling, and publishing the Thirteenth Census of the United States, rent of office quarters, for carrying on during the decennial census period all other census work authorized and directed by law, including purchase, rental, construction, repair, and exchange of mechanical appliances, to continue available until June thirtieth, nineteen hundred and twelve, ten million dollars.

The Director of the Census is authorized to designate three commissioners, with the status of special agents, as provided by the permanent census Act, to represent the United States in the International Commission for the Revision of the Classification of Diseases and Causes of Death, called by the Government of France to meet at Paris in July, nineteen hundred and nine, one of whom shall be chosen from the Census Office, one from the medical profession, and one from the organized registration officials of the United States. For the compensation and traveling expenses of said commissioners not exceeding two thousand five hundred dollars of the foregoing appropriation may be expended.

J. G. CANNON,
Speaker of the House of Representatives.
J. S. SHERMAN,
Vice-President of the United States and
President of the Senate.

Approved, June 29, 1909.

WM. H. TAFT.

Following is the preliminary report of the Census Commission appointed under the above law:

PRELIMINARY REPORT TO THE DIRECTOR OF THE CENSUS OF THE UNITED STATES CENSUS COMMISSION TO THE SECOND DECENNIAL REVISION OF THE INTERNATIONAL CLASSIFICATION OF DISEASES AND CAUSES OF DEATH, PARIS, JULY 1 TO 3, 1909.

WASHINGTON, D. C., August 2, 1909.

SIR: The undersigned, members of the special Census Commission appointed by you to attend the Second Decennial Revision of the International Classification of Diseases and Causes of Death, Paris, July 1 to 3, 1909, have the honor to submit the following preliminary report:

Two of the members of the commission, Doctor Batt, chairman of the committee on classification of the American Public Health Association, representing the organized registration officials of the United States, and Doctor Wilbur, chief statistician of the census, sailed from New York on the steamship *Kaiser Wilhelm der Grosse* June 22 and arrived at Paris on June 29. One of the members, Doctor Foster, chairman of the committee on nomenclature and classification of diseases of the American Medical Association, was, at the last moment, unable to sail, and it was then too late to provide for a substitute in behalf of the organized medical profession, which he particularly represented. Fortunately, the recommendations of his committee were in the hands of the other members of your commission in attendance on the international commission, and thus the wishes of American physicians in regard to the form of the classification under which their reports will be compiled in the United States for the ensuing ten years were given full consideration.

On arriving at Paris the first step was to secure full credentials through the kind agencies of Hon. Henry White, American Ambassador, and the State Department at Washington, for the delegates whose lateness of appointment had precluded the earlier issue of their authorizations. This was accomplished by cable and by special expedition on the part of the French foreign office, so that all of the American delegates took part in the regular proceedings of the first day's session of the international commission.

The American delegates in attendance were the following:

Dr. Frank L. Pleadwell, surgeon, United States Navy.

Prof. Walter F. Willcox, Cornell University.

Dr. H. D. Geddings, Assistant Surgeon-General, United States Public Health and Marine-Hospital Service.

Dr. Wilmer R. Batt, registrar of records, city of New York.

Dr. Wilmer R. Batt, state registrar, Pennsylvania.

Dr. Cressy L. Wilbur, chief statistician, United States Census.

Twenty-one countries were represented in the international commission, which met in the spacious hall of the ministry of the interior. The labor of the delegates was greatly facilitated by the *Exposé sommaire des observations présentées par diverses autorités statistiques*, a pamphlet of 130 pages prepared by the secretary-general, Dr. Jacques Bertillon, a copy of which accompanies this report. This pamphlet contains the suggestions submitted by the various countries, except such as came up during the course of the session. A full printed report of the proceedings (*procès-verbaux*) is now in preparation by Doctor Bertillon, and will be submitted by your commission as a part of its final report.

The proceedings were harmonious and marked by full appreciation of the important principle that, in view of the inestimable advantages of international uniformity, some preferences of each of the individual countries must be subordinated in order to make the resulting classification of the greatest value to all of the countries as a whole. A very considerable number of the American recommendations were approved; especially was the entire rearrangement of deaths from violent causes, as suggested by the American delegates, adopted in principle and in a way that will aid greatly in the proper presentation of the statistics relating to this very important class of deaths.

In accordance with a resolution of the international commission, it was decided to prepare an official version of the titles in each language represented. Doctor Wilbur was selected to prepare the English translation, and was aided by the American delegates and also by Hon. G. H. Knibbs, commonwealth statistician of Australia. Precisely the same tabular list will thus be used in all English-speaking countries employing the International Classification.

In recognition of the active interest of the United States in the promotion of international uniformity, the honor of the vice-presidency of the international commission was extended to Doctor Wilbur, and he presided over one of the sessions.

The session closed on July 3, and on the following day the delegates were received by the President of France and Madame Fallières at the Élysée Palace. Provision was made for the calling, by the French Government, of the Third Decennial Commission of Revision, should no other arrangement be made, in 1919. It is thus insured, as originally proposed by the United States Census Bureau, that each decennial revision shall take place in the year prior to the federal census, thus enabling the latest and most acceptable classification of causes of death to be used for the census year. It is hoped that the next decennial revision, that of 1919, may be held at Washington. A suggestion to this effect was well received, although, of course, no formal invitation could be extended. The progress of American vital statistics, to which renewed impetus will be given by the action of Congress in providing for representation in this commission of the registration officials and medical men upon whom the Federal Government is dependent for its mortality data, should by that time well warrant the favorable consideration of an invitation from the American Government.

The cordial thanks of the members of this commission are due to the officials of the French Government, and especially to Dr. Jacques Bertillon, secretary-general, and M. Lucien March, *chef de la statistique générale de la France*, and to Hon. Henry White, American ambassador, for aid and courtesies extended.

Respectfully submitted.

WILMER R. BATT.

FRANK P. FOSTER.

CRESSY L. WILBUR.

HON. E. DANA DURAND,

Director of the Census.

OFFICIAL ENGLISH TRANSLATION OF THE REVISED LIST OF TITLES.

In accordance with a resolution adopted by the International Commission, it was considered desirable that an official list of titles of the revised International Classification should be prepared from the French version for each of the languages represented in the commission. This was necessary because some confusion had heretofore arisen as to the terms to be employed in various languages, and an exact and literal translation of the French might result in the inclusion in the statistical lists of terms that are entirely absent from the medical nomenclature of the country. As an example, *abcès froid et par congestion*, of the old classification, if literally translated as "abscess, cold and by congestion," presents a title that does not correspond with the medical terms ordinarily used by English-speaking physicians. The chief statistician of the Bureau of the Census was appointed by the International Commission to prepare the English list, and for valuable assistance thanks are due to Doctor Pleadwell and other American delegates and to Hon. G. H. Knibbs, commonwealth statistician of Australia, as well as to Doctor Bertillon personally, in whose office at Paris a part of the work was performed. The English list was made originally on the basis of the first copy of the revised list prepared by Doctor Bertillon, and as some changes were noted in a second list received after returning to the United States, it may be that a few minor corrections will appear in the final and definitive list which will be published in the annual report on Mortality Statistics, 1908.

In adapting the first revision of the International Classification to the use of the Bureau of the Census some of the titles were considerably simplified and various subdivisions were made in order to give special information in regard to certain causes of death not separately stated in the international list. For the Second Decennial Revision, however, this practice will be followed only in part. The full official English translation of the titles of the International Classification will be used without any change or alteration for the principal tables of causes of death. Each title will be preceded by its serial number, so that easy reference can be made to the statistics of individual causes by statisticians in other countries who are not familiar with the English language. Many of the numbers have remained unchanged, so that title No. 1 stands for typhoid fever, title No. 79 for organic diseases of the heart, etc., just as they have since 1900 in every country using this system. This is a great practical convenience and insures accuracy in consulting foreign reports. It is recommended that all the American states and cities use the full international titles, preceding each with its list number. Of course, for many purposes, selected titles may be taken from the general list, in which case it is desirable also that

the list number should be retained; or if two or more titles are combined, the basis of the union should be stated plainly, so that it will be known just what international titles are involved. For use in bulletins and for certain purposes in annual reports where a condensed list of diseases is advisable, the abridged form of the International Classification may be used.

It should be understood by physicians and pathologists who examine the titles of the revised International Classification that it is necessary for statistical purposes that many indefinite and unsatisfactory terms be retained because physicians still continue to report deaths thereunder. It is planned to publish and distribute to physicians and local registrars in the United States a pamphlet containing the titles of the International Classification, showing which of them are proper terms according to the present ideas of medical nomenclature, and also containing information as to more specific statements that should be required relative to certain causes. For example, "cancer" is an indefinite term. The physician should specify carcinoma, sarcoma, or other form of malignant neoplasm, and if this were done, it would be practicable to present tables showing the distribution of the definite forms of malignant disease. In practice, however, so many deaths are reported simply as "cancer" that the attempted distinction in statistical tables is of little value, and hence the second revision, like the first one, does not undertake to make it. This is no reason, however, why local registrars should not endeavor to obtain statements of a more specific character whenever possible in regard to deaths from malignant growths.

The International Classification is elastic. While providing a fixed form for the statistical titles of the tabular list and a specified order of arrangement of those titles, it is entirely consistent with its principles to employ various different subdivisions of the titles when such are considered necessary. As an example, for the mortality statistics of the United States Army, the Surgeon-General requires minute differentiations in the monthly reports of sick and wounded in regard to malaria. Malaria constitutes a single title (No. 4) of the International Classification, with one subdivision for the special statement of deaths from malarial cachexia when these are sufficiently numerous to require such a statement to be made. The Surgeon-General subdivides the title as follows:

4. Malarial fevers:
 1. Nonmalignant infection.
 - a. Intermittent.
 - b. Remittent or continued.
 2. Malignant (estivo-autumnal) infection.
 - a. Intermittent.
 - b. Remittent or continued.
 - c. Pernicious.
 - 2½. Undetermined infection.
 - a. Intermittent.
 - b. Remittent or continued.
 3. Malarial cachexia.
 4. Hemoglobinuric fever.

Such minuteness would, of course, be entirely impracticable in general mortality returns, although extremely desirable when, as in the case above, the reports are made by army surgeons who can be required to make the specific distinctions desired; yet the aggregate of the various forms of malaria returned is exactly equivalent to title 4 of the International Classification and is thus fully comparable with the civil records compiled under this system. For the census tables certain subdivisions will be made of various titles of the International Classification, as, for example, title 92, pneumonia, will be subdivided into deaths returned from (a) lobar pneumonia and its definite synonyms, such as croupous pneumonia, and deaths returned simply from (b) pneumonia, without further definition. These latter, in many instances, may have been bronchopneumonia. Dr. John Tatham, medical superintendent of the Registrar-General's office of England, makes a similar differentiation in the forms of pneumonia, specifying also epidemic pneumonia, although the nomenclature of the Royal College of Physicians gives only pneumonia as the accepted term. The orthography of the list, which differs somewhat from that previously used in the annual reports, is that recommended by the committee on nomenclature of the American Medical Association.

Lastly, in examining the general form of the "classification," it should be remembered that the scientific *classification* of diseases, in the primary sense of the word, is a thing apart from the object of this list, which is merely a *list* of causes of death, arranged by international agreement for use in mortality tables. The use of the word "list" in this connection is strongly recommended by such eminent authorities as Dr. Arthur Newsholme and Dr. John Tatham, and follows the practice of the latter in the tables of causes of death in the annual reports of the Registrar-General of England, wherein only the individual causes are presented and the so-called classes or groups of diseases are dispensed with. A motion to dispense with the "classes" in the international system nearly prevailed at Paris, but the general opinion favored the retention of the "classification," as a mere skeleton upon which to arrange the all-important individual titles, for at least one decade more. In the annual reports on mortality statistics prepared by the Bureau of the Census very little attention will be paid to the "classes" of diseases in future, and the word "classification," which is familiar to registration officials and statisticians in the special sense of a mere tabular arrangement of causes of death (see *Mortality Statistics, 1907*, page 22), will be abandoned more and more in favor of the terms "list" or "tabular list." The full statement of the individual terms embraced under each of the titles of the list of causes of death will be published as soon as the official French report

is available, thus furnishing for the revised classification what will correspond to the Manual of International Classification of Causes of Death which was published by the Bureau of the Census in 1902 and is now generally in use by all the registration offices of the United States in connection with the present system.

CLASSIFICATION OF DISEASES PREPARED BY THE INTERNATIONAL COMMISSION.

(Paris, July 1 to 3, 1909.)

GENERAL NOTE.—The diseases which appear only in the returns of sickness and not as causes of death are printed in *italics*; they bear the same numbers as those of the causes of death to which they are the most closely related, and are only distinguished by the letters "A," "B," etc., so that the same numbers may be preserved in each classification. Meningitis is allowed to remain in its former position in order to preserve unchanged a large number of old numbers. The title numbers designated by an asterisk (*) are those that remain the same as before the revision. [The remark upon meningitis refers more particularly to cerebrospinal fever (synonym, epidemic cerebrospinal meningitis), which, in the second revision of 1909, as in the first revision of 1900, is retained under diseases of the nervous system, in connection with meningitis (unqualified), instead of being transferred to general diseases.]

The statistics of causes of death should be presented with as full detail as possible with respect to age, and with at least the following groups: 0 to 1 year; 1 to 19 years; 20 to 39 years; 40 to 59 years; 60 years and over. The second group should be divided whenever possible into 1 to 9 years and 10 to 19 years.

Principal changes made in the classification of 1900 (causes of death).

Eighteen new titles have been added, as follows: Beriberi, acute miliary tuberculosis, rickets, neuritis, ankylostomiasis, chyluria, and twelve additional titles for deaths from violence. Nine titles have been suppressed and eight transposed, nevertheless the former numbers have been preserved for 110 titles. The numbering has been changed for present titles 24 to 38, 72 and 73, 85 to 118, 121 to 127 (56 titles in all), and for title 164 and those following, except title 167.

OFFICIAL ENGLISH TRANSLATION.

(Diseases and causes of death.)

I.—GENERAL DISEASES.

- 1* Typhoid fever.
- 2* Typhus fever.
- 3* Relapsing fever.
- 4* Malaria.
- 4a* *Including: Malarial cachexia.*
- 5* Smallpox.
- 6* Measles.
- 7* Scarlet fever.
- 8* Whooping cough.
- 9* Diphtheria and croup.
- 9a* *Including: Croup.*
- 10* Influenza.
- 11* Miliary fever.
- 12* Asiatic cholera.
- 13* Cholera nostras.
- 14* Dysentery.
- 15* Plague.
- 16* Yellow fever.
- 17* Leprosy.
- 18* Erysipelas.
- 19* Other epidemic diseases.
- 20* Purulent infection and septicaemia.

OFFICIAL ENGLISH TRANSLATION—Continued.

I.—GENERAL DISEASES—Continued.

- 21* Glanders.
 22* Anthrax.
 23* Rabies.
 24 Tetanus.
 25 Mycoses.
 26 Pellagra.
 27 Beriberi.
 28 Tuberculosis of the lungs.
 29 Acute miliary tuberculosis.
 30 Tuberculous meningitis.
 31 Abdominal tuberculosis.
 32 Pott's disease.
 33 White swellings.
 34 Tuberculosis of other organs.
 35 Disseminated tuberculosis.
 36 Rickets.
 37 Syphilis:
 A. *Primary*.
 B. *Secondary*.
 C. *Tertiary*.
 D. *Hereditary*.
 E. *Period not stated*.
 37a *Soft chancre*.
 38 Gonococcus infection.
 39* Cancer and other malignant tumors of the buccal cavity.
 40* Cancer and other malignant tumors of the stomach, liver.
 41* Cancer and other malignant tumors of the peritoneum, intestines, rectum.
 42* Cancer and other malignant tumors of the female genital organs.
 43* Cancer and other malignant tumors of the breast.
 44* Cancer and other malignant tumors of the skin.
 45* Cancer and other malignant tumors of other organs and of organs not specified.
 46* Other tumors (tumors of the female genital organs excepted).
 47* Acute articular rheumatism.
 48* Chronic rheumatism and gout.
 49* Scurvy.
 50* Diabetes.
 51* Exophthalmic goitre
 52* Addison's disease.
 53* Leuchaemia.
 54* Anaemia, chlorosis.
 55* Other general diseases.
 56* Alcoholism (acute or chronic).
 57* Chronic lead poisoning.
 58* Other chronic occupation poisonings.
 59* Other chronic poisonings.

II.—DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE.

- 60* Encephalitis.
 61* Simple meningitis.
 61a* *Including: Cerebrospinal fever*.
 62* Locomotor ataxia.
 63* Other diseases of the spinal cord.
 64* Cerebral haemorrhage, apoplexy.
 65* Softening of the brain.
 66* Paralysis without specified cause.
 67* General paralysis of the insane.
 68* Other forms of mental alienation.
 69* Epilepsy.
 70* Convulsions (nonpuerperal).
 71* Convulsions of infants.
 72 Chorea.
 73A Hysteria.

OFFICIAL ENGLISH TRANSLATION—Continued.

II.—DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE.—Continued.

- 73B *Neuralgia and neuritis*.
 74* Other diseases of the nervous system.
 75A* *Follicular conjunctivitis*.
 75B* *Trachoma*.
 75C* [Other] diseases of the eyes and their adnexa.
 76* Diseases of the ears.

III.—DISEASES OF THE CIRCULATORY SYSTEM.

- 77* Pericarditis.
 78* Acute endocarditis.
 79* Organic diseases of the heart.
 80* Angina pectoris.
 81* Diseases of the arteries, atheroma, aneurysm, etc.
 82* Embolism and thrombosis.
 83* Diseases of the veins (varices, haemorrhoids, phlebitis, etc.).
 84* Diseases of the lymphatic system (lymphangitis, etc.).
 85 Haemorrhage; other diseases of the circulatory system.

IV.—DISEASES OF THE RESPIRATORY SYSTEM.

- 86 Diseases of the nasal fossae.
 87 Diseases of the larynx.
 88 Diseases of the thyroid body.
 89 Acute bronchitis.
 90 Chronic bronchitis.
 91 Bronchopneumonia.
 92 Pneumonia.
 93 Pleurisy.
 94 Pulmonary congestion, pulmonary apoplexy.
 95 Gangrene of the lung.
 96 Asthma.
 97 Pulmonary emphysema.
 98 Other diseases of the respiratory system (tuberculosis excepted).

V.—DISEASES OF THE DIGESTIVE SYSTEM.

- 99A *Diseases of the teeth and gums*.
 99B [Other] diseases of the mouth and annexa.
 100 Diseases of the pharynx.
 101 Diseases of the oesophagus.
 102 Ulcer of the stomach.
 103 Other diseases of the stomach (cancer excepted).
 104 Diarrhoea and enteritis (under 2 years).
 105 Diarrhoea and enteritis (2 years and over).
 106 Ankylostomiasis.
 107* Intestinal parasites.
 108 Appendicitis and typhlitis.
 109 Hernias, intestinal obstructions.
 110A *Diseases of the anus and faecal fistulas*.
 110B Other diseases of the intestine.
 111 Acute yellow atrophy of the liver.
 112 Hydatid tumor of the liver.
 113 Cirrhosis of the liver.
 114 Biliary calculi.
 115 Other diseases of the liver.
 116 Diseases of the spleen.
 117 Simple peritonitis (nonpuerperal).
 118 Other diseases of the digestive system (cancer and tuberculosis excepted).

VI.—NONVENEREAL DISEASES OF THE GENITO-URINARY SYSTEM AND ANNEXA.

- 119* Acute nephritis.
 120* Bright's disease.
 121 Chyluria.
 122 Other diseases of the kidneys and annexa.

OFFICIAL ENGLISH TRANSLATION—Continued.

VI. NONVENEREAL DISEASES OF THE GENITO-URINARY SYSTEM AND ANNEXA—Continued.

- 123 Calculi of the urinary passages.
- 124 Diseases of the bladder.
- 125 Other diseases of the urethra, urinary abscess, etc.
- 126 Diseases of the prostate.
- 127 Nonvenereal diseases of the male genital organs.
- 128* Uterine haemorrhage (nonpuerperal).
- 129* Uterine tumor (noncancerous).
- 130A *Metritis*.
- 130B* [Other] diseases of the uterus.
- 131* Cysts and other tumors of the ovary.
- 132* Salpingitis and other diseases of the female genital organs.
- 133* Nonpuerperal diseases of the breast (cancer excepted).

VII.—THE PUERPERAL STATE.

- 134A* *Normal labor*.
- 134B* Accidents of pregnancy.
- 135* Puerperal haemorrhage.
- 136* Other accidents of labor.
- 137* Puerperal septicaemia.
- 138* Puerperal albuminuria and convulsions.
- 139* Puerperal phlegmasia alba dolens, embolus, sudden death.
- 140* Following childbirth (not otherwise defined).
- 141* Puerperal diseases of the breast.

VIII.—DISEASES OF THE SKIN AND OF THE CELLULAR TISSUE.

- 142* Gangrene.
- 143* Furuncle.
- 144* Acute abscess.
- 145A* *Trichophytosis*.
- 145B* *Scabies*.
- 145C* Other diseases of the skin and annexa.

IX.—DISEASES OF THE BONES AND OF THE ORGANS OF LOCOMOTION.

- 146* Diseases of the bones (tuberculosis excepted).
- 147* Diseases of the joints (tuberculosis and rheumatism excepted).
- 148* Amputations.
- 149* Other diseases of the organs of locomotion.

X.—MALFORMATIONS.

- 150* Congenital malformations (stillbirths not included).

XI.—DISEASES OF EARLY INFANCY.

- 151A* *Nurslings discharged from hospital without disease*.
- 151B* Congenital debility, icterus, and sclerema.
- 152* Other diseases peculiar to early infancy.
- 153* Lack of care.

XII.—OLD AGE.

- 154* Senility.

XIII.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.

- 155* Suicide by poison.
- 156* Suicide by asphyxia.
- 157* Suicide by hanging or strangulation.
- 158* Suicide by drowning.
- 159* Suicide by firearms.
- 160* Suicide by cutting or piercing instruments.
- 161* Suicide by jumping from a high place.
- 162* Suicide by crushing.
- 163* Other suicides.
- 164 Poisoning by food.
- 165A *Venomous bites and stings*.

OFFICIAL ENGLISH TRANSLATION—Continued.

XIII. AFFECTIONS PRODUCED BY EXTERNAL CAUSES—Continued.

- 165B Other acute poisonings.
- 166 Conflagration.
- 167* Burns (conflagration excepted).
- 168 Absorption of deleterious gases (conflagration excepted).
- 169 Accidental drowning.
- 170 Traumatism by firearms.
- 171 Traumatism by cutting or piercing instruments.
- 172 Traumatism by fall.
- 173 Traumatism in mines and quarries.
- 174 Traumatism by machines.
- 175 Traumatism by other crushing (vehicles, railroad, land-slides, etc.).
- 176 Injuries by animals.
- 177A *Over-exertion*.
- 177B Starvation.
- 178 Excessive cold.
- 179 Effects of heat.
- 180 Lightning.
- 181 Electricity (lightning excepted).
- 182 Homicide by firearms.
- 183 Homicide by cutting or piercing instruments.
- 184 Homicide by other means.
- 185A *Dislocations*.
- 185B *Sprains*.
- 185C Fractures (cause not specified).
- 186 Other external violence.

XIV.—ILL-DEFINED DISEASES.

- 187 Ill-defined organic disease.
- 188 Sudden death.
- 189 Cause of death not specified or ill-defined.
- 189A *No disease, feigned disease*.

ABRIDGED CLASSIFICATION ADOPTED IN 1909.

NOTE.—The diseases which cause death only rarely need not be shown, except for morbidity statistics; they are printed in *italics* below, and are numbered "15a," "15b," etc., in order to preserve the same reference numbers for the morbidity and mortality classifications.

- 1 Typhoid fever.
- 2 Typhus fever.
- 3 Malaria.
- 4 Smallpox.
- 5 Measles.
- 6 Scarlet fever.
- 7 Whooping cough.
- 8 Diphtheria and croup.
- 9 Influenza.
- 10 Asiatic cholera.
- 11 Cholera nostras.
- 12 Other epidemic diseases.
- 13 Tuberculosis of the lungs.
- 14 Tuberculous meningitis.
- 15 Other forms of tuberculosis.
- 15a *Syphilis*.
- 15b *Gonococcus infection*.
- 16 Cancer and other malignant tumors.
- 16a Rheumatism.
- 17 Simple meningitis.
- 18 Cerebral haemorrhage and softening.
- 18a *Diseases of the eyes*.
- 19 Organic diseases of the heart.
- 19a *Diseases of the veins (varices, phlebitis, etc.)*.
- 20 Acute bronchitis.
- 21 Chronic bronchitis.

ABRIDGED CLASSIFICATION ADOPTED IN 1909—Continued.

- 22 Pneumonia.
- 23 Other diseases of the circulatory system.
- 24 Diseases of the stomach (cancer excepted).
- 25 Diarrhoea and enteritis (under 2 years of age).
- 26 Appendicitis and typhlitis.
- 27 Hernias, intestinal obstructions.
- 28 Cirrhosis of the liver.
- 29 Nephritis and Bright's disease.
- 30 Noncancerous tumors and other diseases of the female genital organs.
- 31 Puerperal septicaemia (puerperal fever, peritonitis, phlebitis).
- 31a *Normal labor.*
- 32 Other puerperal accidents of pregnancy and labor.
- 32a *Diseases of the skin.*
- 32b *Nurslings discharged from hospitals without disease.*
- 33 Congenital debility and malformations.
- 34 Senile debility.
- 35 Violent deaths (suicides excepted).

ABRIDGED CLASSIFICATION ADOPTED IN 1909—Continued.

- 35a Suicides.
- 36 Other diseases.
- 37 Unknown or ill-defined diseases.
- 37a *No disease, feigned disease.*

INTRAUTERINE CAUSES OF DEATH.

- 1 Syphilis.
- 2 Other general diseases of the mother.
- 3 Predisposition of the mother to abortion.
- 4 Albuminuria and other diseases incident to pregnancy.
- 5 Traumatism and overwork.
- 6 Diseases of the placenta and of the membranes.
- 7 Malformations of the infant.
- 8 Premature birth.
- 9 Difficult labor.
- 10 Prolapse and compression of the cord.
- 11 Asphyxia of the child.
- 12 Other and unclassified causes.
- 13 Causes not specified or unknown.