

A HALF CENTURY'S PROGRESS
AGAINST TUBERCULOSIS
IN NEW YORK CITY
1900-1950



By
GODIAS J. DROLET
and
ANTHONY M. LOWELL



NEW YORK TUBERCULOSIS
AND HEALTH ASSOCIATION
1952

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A review of historical developments in the campaign against tuberculosis in New York City, including selected information dealing with health conditions beginning in 1804 and covering the era prior to the consolidation in 1898 of the five boroughs into the City of Greater New York. Secondly, a summary of the statistics relating to the prevalence of tuberculosis between 1900 and 1950 with reference section of the annual records of registration of tuberculosis cases and deaths.

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NEW YORK TUBERCULOSIS
AND HEALTH ASSOCIATION

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TO

Physicians, nurses, social workers,
public and private officials who labor
daily in the vineyard succoring the sick,
and relieving the anxiety of the needy,
this compendium which attempts
to measure their life-saving
work is humbly offered.

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FOREWORD

THE Statistical Division of the New York Tuberculosis and Health Association receives throughout the year numerous calls for statistics dealing with tuberculosis and other health conditions in New York City. These enquiries come from physicians, health and social workers, educators, representatives of the press, students, as well as from the general public. It is obvious that in a large community like New York sources of information of this type are scattered and not always known to many. The detailed data in the present monograph have therefore been assembled to assist all interested in precise information on the subject.

This reference handbook has been prepared to make readily available the important record of tuberculosis in New York City during the first half of the present century. There have been added selected reports dealing briefly with general health conditions now and prior to the Twentieth Century, also a few recent statistics concerning the United States, the larger cities and the various states. These comparative data we hope will help the reader to appreciate better the significance and the relative importance of New York City's health conditions between 1900 and 1950.

The authors wish to express their sincere thanks first of all for the cordial and helpful assistance given them by the Department of Health of the City of New York, particularly the officials of the Bureau of Tuberculosis and of the Bureau of Records and Statistics, likewise the Population Division of the United States Bureau of the Census in making available basic reports.

Within the Association we are indebted to Mr. Thomas H. Darling and Mr. Julius F. Koch for their skillful assistance in the preparation of charts and maps included in this handbook, likewise to Mrs. Claire Turtz for the expert care taken in the difficult reproduction of the many statistical tables. The authors have also had the benefit of the long experience in social and health work of Mrs. K. Z. Whipple, who reviewed the entire manuscript.

The constant encouragement and support of Dr. Herbert R. Edwards, former Director of the Bureau of Tuberculosis of the Department of Health of the City of New York and now the Executive Director of the New York Tuberculosis and Health Association, has contributed greatly to the completion of this task.

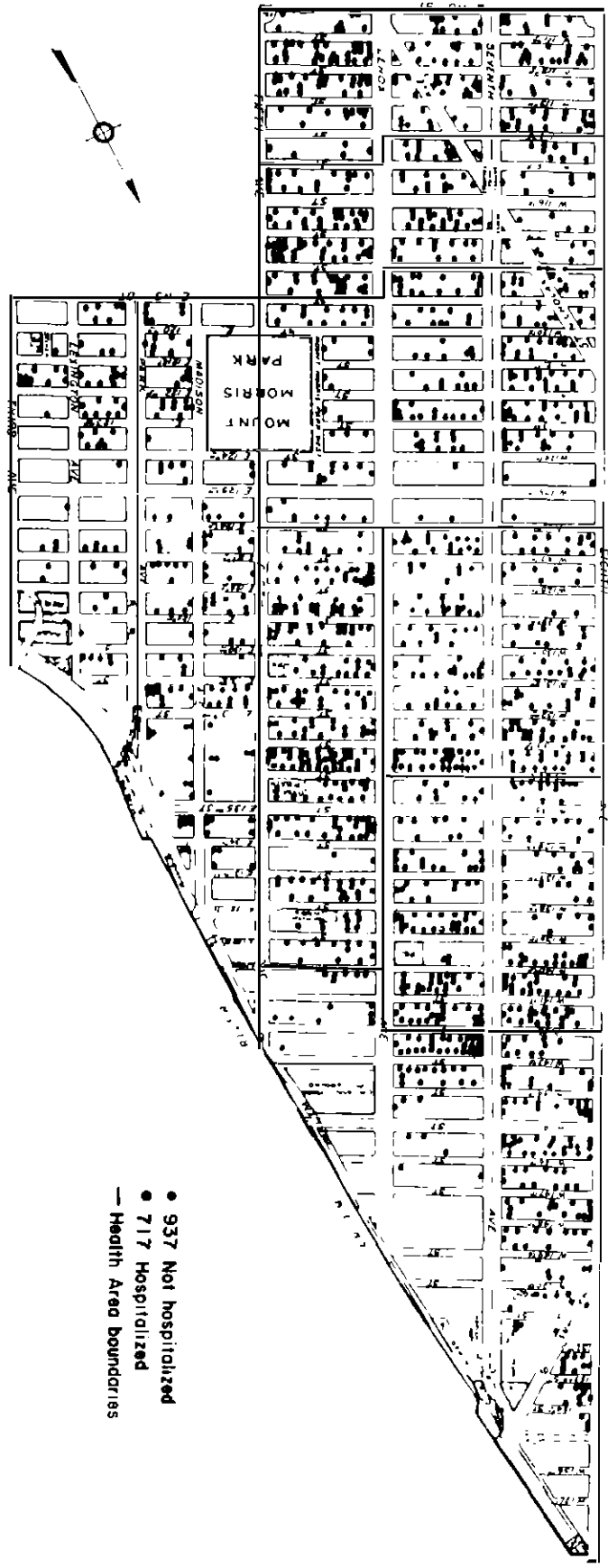
November, 1952

GODIAS J. DROLET

ANTHONY M. LOWELL

There are still "LUNG BLOCKS" riddled with tuberculosis in New York City.

TUBERCULOSIS CASES* - CENTRAL HARLEM



Map prepared by the Bureau of Census, U.S. Department of Commerce, under contract to the U.S. Public Health Service, Division of Tuberculosis Control, New York City, New York, 1951.

*1654 Known cases of tuberculosis registered with the Department of Health on June 1, 1951

"OLD NEW YORK", 1800-1900

OLD New York, it must be remembered, prior to 1898 included only the territory now described as the boroughs of Manhattan and of the Bronx. At the beginning of the previous century, namely in 1800, it had barely sixty-two thousand inhabitants. As a matter of fact, even in 1810 the population totalled 96,373 only; but by 1830 it had doubled, being then 202,589. Twenty years later, in 1850, the population was two and a half times as great, being well over a half a million (515,394).

From 1850 to 1870 New York's population multiplied again two and a half times; the city had then a million and a third (1,340,704) inhabitants. The next twenty years saw another million added; the Federal Census of 1890 accounted for 2,368,671 inhabitants.

Finally, at the close of the nineteenth century, New York City could boast of a population of three million and a half. But at that time there had been added onto the original territory the spacious boroughs of Brooklyn, Queens and Richmond.

A brief review of health conditions during the nineteenth century is needed if we are to appreciate the remarkably favorable conditions prevailing subsequently. As against a general death rate in New York of only 10 per thousand population nowadays, death rates two and three times as much were the rule formerly; during certain epidemics they rose almost to 50, particularly when cholera struck.

Sanitary knowledge in those days was exceedingly indefinite. Such diseases of childhood as diphtheria and scarlet fever were thought to be due "to climatic conditions, to fear, or to the will of God". Superstitious beliefs were prevalent, the germ theory of disease was unknown or those who did believe in germs held to the doctrine of spontaneous generation. While vaccination for smallpox was known, its popularity was hampered by defective and often contaminated application. Furthermore, the extremely rapid growth of population, especially in Manhattan, led to extreme over-crowding and an excessive spread of communicable diseases.

As quoted by Armstrong(1), from Stephen Smith's book, "The City that Was", it was said of conditions about 1860 that "New York gradually became the natural home of every variety of contagious disease, and the favorite resort of foreign pestilences. Smallpox, scarlet fever, measles, diphtheria were domestic pestilences with which the people were so familiar that they regarded them as necessary features of childhood. Malarial fevers...were regularly announced in the autumnal months as having appeared with their 'usual severity'. The 'White Plague' or consumption was the common inheritance of the poor and the rich alike.

"With the immigrant came typhus and typhoid fevers which resistlessly swept through the tenement houses decimating the poverty-stricken tenants. At intervals, the great oriental plague, Asiatic cholera, swooped down upon the city with fatal energy and gathered its enormous harvest of dead...Very few tenements had waterclosets in the houses; they had privies in the yard, which as a rule were insufficient for the accommodation of the numbers of people crowded into the houses; many were not connected with the sewers; they were seldom cleaned and often allowed to overflow...rendering the neighborhood offensive..."

Unique reports tabulated by Dowling of the City Inspector's Department for the fifty years from 1804 to 1853, give a precise evaluation of mortality rates at the beginning of the nineteenth century. During the five-year period 1804-1808, when the city's population was slightly over 80,000, the general death rate was nearly 28 per thousand. Almost twenty-five percent of all the deaths was assigned to "consumption". The second leading cause of death in the terms of the day was "convulsions"; this was followed by cholera infantum, marasmus and atrophica. Some deaths were listed as due to odd causes. It is related for instance in 1805 that there had been 11 deaths due to "drinking cold water". In reports of a few years later only, there were listed deaths due "to furor of the womb"; others, as caused by rattlesnake bites; even "fright" was listed as cause of death. In the 1830's, many deaths were charged to "salivation". In those unsanitary days, it is not surprising likewise that many deaths were due to "worms".

An interesting and precise measurement of the mortality at that time was made by Mary Dalton(2), in 1934 from "The Returns of Death in the City of New York for the years, 1804, 1805, 1806, 1807 and 1808." Going carefully over the records she worked out that the expectancy of life at that time for those who had survived to age twenty was 29.8 years. The significance of that figure can be better understood when we see that nowadays the expectancy of life over and above that age for men is close to fifty years and for women exceeds even fifty-four years.

Child life in those days was exposed to extreme dangers; the infant mortality rate often reached from 240 to 250 per thousand births; in other words one child out of every four born was dead by the end of the first year.

Fifty years later, namely during the five-year period 1849-1853, the general death rate averaged even fifty percent higher, namely 39.7 per thousand population. Just at that time an epidemic of cholera along with smallpox and dysentery had smitten the population and caused an extreme loss of life. Even then, "consumption" still headed the death list, striking at a rate of 431 per hundred thousand population. Once more, the second leading cause of death was said to be due to "convulsions", followed this time by "cholera".

For the first time among the leading causes of death in 1850 mention of "heart disease" is made; but above it was "dropsy", whatever may have been its causes. Deaths due to "apoplexy" also exceeded

LEADING CAUSES OF DEATH, OLD NEW YORK (Manhattan, Bronx)

Five-Year Period 1804-1808

Five-Year Period 1849-1853

Cause of Death	Annual Average	
	Deaths	Rate*
Consumption	438	550
Convulsions	188	236
Cholera infantum	129	162
Marasmus, atrophia	124	156
Inflam. chest, lungs	101	127
Croup	88	110
Dropsy	86	108
Casualties, violence	79	99
Smallpox	74	93
Typhus, typhoid	73	92
Yellow fever	54	68
Dysentery	43	54
Worms	42	53
Whooping cough	36	45
Teething	36	45
Inflam. bowels	34	43
Sprue	26	33
Dropsy in head	23	29
Apoplexy	21	26
Palsy	19	24
Other causes	490	614
All causes	2204	2767

Cause of Death	Annual Average	
	Deaths	Rate*
Consumption	2322	431
Convulsions	1576	292
Cholera	1107	205
Inflam. chest, lungs	1077	200
Marasmus, atrophia	1029	191
Dysentery	956	177
Cholera infantum	839	156
Dropsy in head	801	149
Diarrhea	651	121
Apoplexy	552	102
Croup	476	88
Inflam. bowels, stomach	470	87
Smallpox	454	84
Scarlet fever	454	84
Debility	432	80
Inflam. brain	405	75
Dropsy	321	60
Heart disease	258	48
Measles	230	43
Congest. lungs	219	41
Other causes	6787	1258
All causes	21416	3972

Population 1806 = 79,653.

Population 1851 = 539,107.

*Per 100,000. Based upon records of City Inspector's Department.

LEADING CAUSES OF DEATH, NEW YORK CITY
(Manhattan, Bronx, Brooklyn, Queens, Richmond)

Five-Year Period 1900-1904

Five-Year Period 1945-1949

Cause of Death	Annual Average	
	Deaths	Rate*
Pneumonias	10222	279
Tuberculosis	9396	256
Diarrhea, enteritis	6204	169
Nephritis, Bright's dis.	5634	154
Heart diseases	4664	127
Violence	4312	118
Apoplexy	2521	69
Cancer	2504	68
Diphtheria, croup	2120	58
Bronchitis	1768	48
Senile debility	1029	28
Scarlet fever	830	23
Cirrhosis of liver	787	21
Typhoid fever	705	19
Measles	676	18
Puerperal dis.	673	18
Convulsions	644	18
Influenza	509	14
Cer. spi. mening.	502	14
Alcoholism	474	13
Other causes	14952	411
All causes	71126	1940

Cause of Death	Annual Average	
	Deaths†	Rate*
Heart diseases	31034	399
Cancer	14560	187
Accidents	3836	49
Cerebral hemorrhage	3665	47
Dis. early infancy	3402	44
Diabetes	3398	44
Tuberculosis	3130	40
Pneumonias	2889	37
Nephritis	2541	33
Dis. liver, gallbladder	1842	24
Dis. arteries	1213	16
Suicide	910	12
Ulcer, stomach, duodenum	663	9
Syphilis	606	8
Hernia, intest. obst.	571	7
Leukemias, aleukemias	551	7
Disease, prostate	418	5
Nonmalignant tumors	346	4
Homicide	345	4
Alcoholism	288	4
Other causes	3629	47
All causes	79837	1027

Population 1902 = 3,665,825.

Population 1947 = 7,771,792.

*Per 100,000. †Classified according to 5th rev. Inter. List Causes of Death. Based upon reports, Bureau of Records and Statistics, Department of Health, City of New York.

those assigned to "heart disease".

We have to study the comparative mortality figures for the five-year period 1900-1904 to appreciate the changes that had occurred during the nineteenth century. During the five years just mentioned, the general death rate was now below 20, namely 19.4 per thousand population. For the first time we find tuberculosis stepping down to second place, being preceded by the pneumonias which were said to be responsible on an average annually for some 10,000 deaths, the mortality rate of the latter being 279 per hundred thousand population. We still find, however, as third leading cause of death, diarrhea and enteritis; then, nephritis and heart diseases.

Epidemics of a Former Day: Nineteenth Century Plagues

First it should be recalled that between 1800 and 1850 the general death rate, except in epidemic years, ranged usually between twenty and thirty per thousand population. Occasionally, with the lack of control of communicable diseases, the nature or cause of which was unknown in those days, the death rate would suddenly rise to even greater levels. Back in 1832 a cholera epidemic was responsible for 3,513 deaths and the death rate that year rose to 49.9 per thousand -- five times our present rate. Another cholera epidemic in 1849, with 5,071 deaths, sent the death rate again to 48.9 (see Fig. 1).

Between 1850 and 1900 the general death rate usually ranged about the same high level as during the first half of that century. Once more cholera struck heavily in 1854, being responsible for 2,509 deaths, while at the same time an epidemic of smallpox came along causing 611 deaths; consequently the death rate was 47.1 that year. It was not until 1897 that the general death rate in New York City fell below 20; that year it was 19.8.

During the nineteenth century under discussion, the population of New York City was repeatedly scourged by a variety of epidemics, smallpox for instance appearing repeatedly. In 1804, it caused 169 deaths in the comparatively small population of those days; in 1824, 394 deaths; in 1851, 562; then in 1865, 664 more; in 1872, 1,666; in 1875, 1,899; in 1881, 503 and, in 1893, 302. The last epidemic of this type occurred in 1901 and 1902 when altogether 720 deaths occurred. Thereafter smallpox was conquered by vaccination.

Cholera, when it came along dealt heavy blows. As already mentioned, in 1832 there were 3,513 deaths, and again in 1849, 5,071. Within another five years, namely in 1854, it caused 2,509 more deaths; then in 1866, 1,137. Fortunately, in 1892 when nine deaths of cholera occurred this was the last visitation of an epidemic of that type.

Of children's diseases, it is to be noted that in 1836 and 1837, measles were responsible for 443 deaths; scarlet fever, for 579 more. In 1887, diphtheria struck most terribly when it caused 4,509 deaths. Mention

Fig. 1

THE CONQUEST OF PESTILENCE IN NEW YORK CITY GENERAL DEATH RATE SINCE 1804

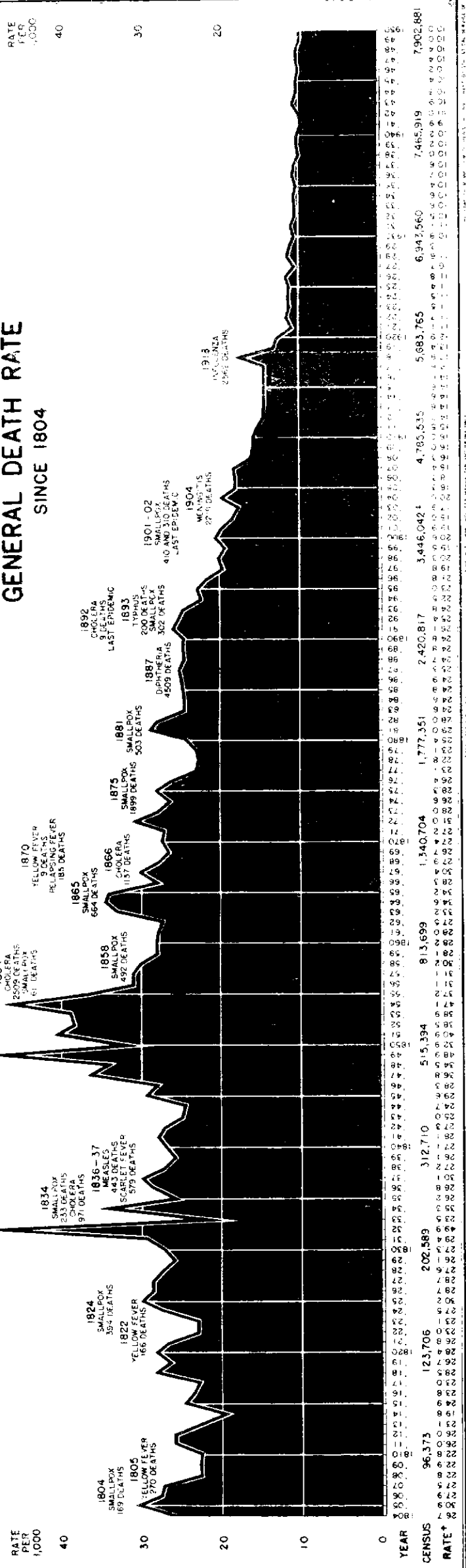
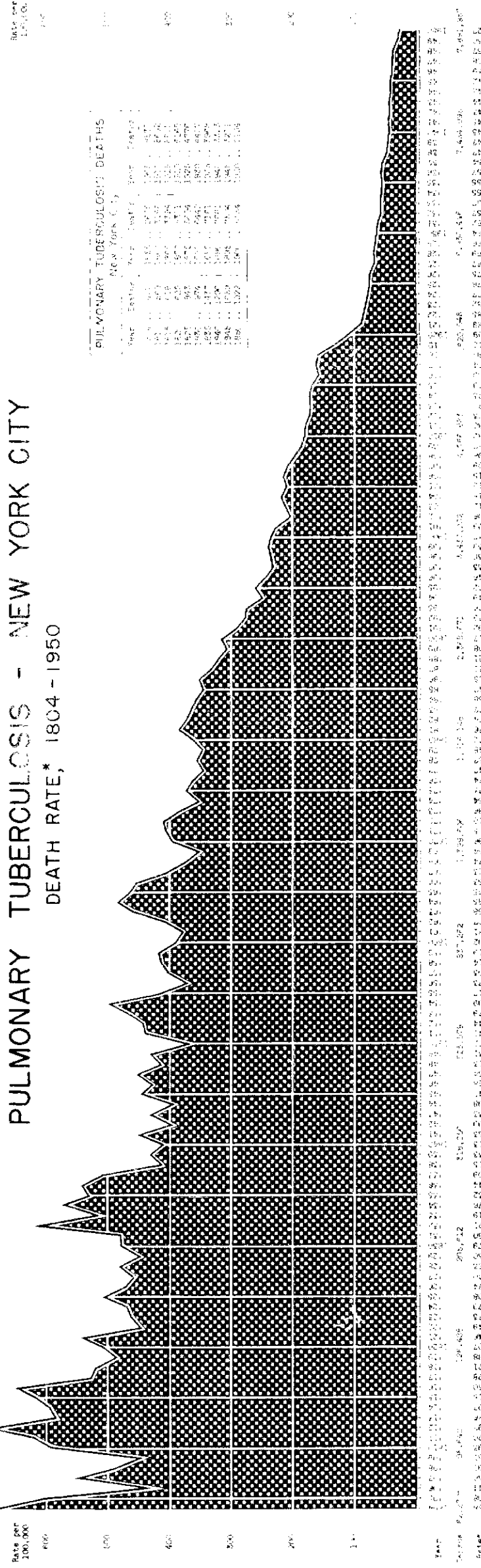


Fig. 2

PULMONARY TUBERCULOSIS - NEW YORK CITY DEATH RATE*, 1804 - 1950



Obtained from records of City Inspector, the Metropolitan Board of Health and the Department of Health, City of New York, by Dr. J. J. Schuler and A. M. Lowell, New York Tuberculosis and Health Association.

is also made in the records of an epidemic of dysentery in 1851 which was responsible for 1,173 deaths. The mortality records of those days do not single out typhoid as being notably responsible and yet deaths from this cause were taking place continuously.

Tuberculosis

In the case of tuberculosis the most dependable records in those days refer to "consumption". For much of that period the specific cause of what we now label as the non-pulmonary forms of tuberculosis was not known and therefore the reports available do not measure the total mortality due to the tubercle bacillus. Without the control we now enjoy of bovine tuberculosis, it is likely that the mortality from this disease in children was excessive.

However, if one looks over the record for "consumption" or pulmonary tuberculosis from 1804, for instance, until the end of that century, it is seen that its rate up to 1840 often rose to 600 or more per hundred thousand population (see Fig. 2).

In 1804, the death rate from pulmonary tuberculosis in New York City was as high as 688 per hundred thousand; in 1812, it even went to 697. It was not until 1838 that the rate came down below 500 per hundred thousand population. Between that year and 1872, it oscillated around 400, often above it. Then, beginning in 1882, started the continuous decline in mortality which has been taking place since that time. However in 1900 the death rate from pulmonary tuberculosis in New York City was 237, which at least was only one-third of what it had been at the beginning of the nineteenth century.

* * *

THE TWENTIETH CENTURY

New York City Grows, 1900 to 1950

IN 1900 the population of New York City totalled nearly three and a half million inhabitants (Federal Census 3,437,202). Only two years previously the annexation of Brooklyn, the various small communities of Queens and Staten Island had added onto the older central section--Manhattan and the Bronx--one million three hundred thousand additional inhabitants. More than one million of them were residents of the up-to-then separate city of Brooklyn.

In Greater New York at that time more than one-half of the total population was then concentrated in the Borough of Manhattan (1,850,093). The 420,000 residents of Staten Island, Bronx, and Queens comprised only twelve percent of the city's population; Brooklyn contained one-third.

Greater New York has an area of 359 square miles. If, however, reference is made only to the land area, it totals 314.2 square miles. Taking Manhattan's 22.3 square miles as a unit, it is seen that the area of the Bronx, 43.4 square miles, is practically double. That of Staten Island, 60.3 square miles, is 2.7 times the size of Manhattan. Brooklyn's 76 square miles reveal that borough to be three and a half times the size of the central borough. Queens overshadows in size all of the other four boroughs; its land area of 112 square miles is five times that of Manhattan.

With nearly 88 percent of New York's population in 1900 concentrated in Manhattan and in Brooklyn, the congestion was greatest in these two boroughs. On an average, in Brooklyn the density of population was 15,300 per square mile; in Manhattan it was more than five times as great, namely 83,000 residents per square mile. In the Bronx the density of population averaged 4,600 per square mile. But in the large and still comparatively undeveloped sections of Queens and of Staten Island the population coverage per mile was only 1,360 and 1,110 respectively. Furthermore, in all these five boroughs the population was far from being evenly distributed. In Manhattan it was then concentrated mostly below Fifty-ninth Street; in the Bronx, mainly in the Mott Haven, Melrose and Morrisania sections; in Brooklyn, in Williamsburg, Fort Greene, Red Hook-Gowanus and the Bedford sections. In Queens, isolated, individual communities prevailed, the larger ones being Long Island City, Astoria, Flushing and Jamaica.

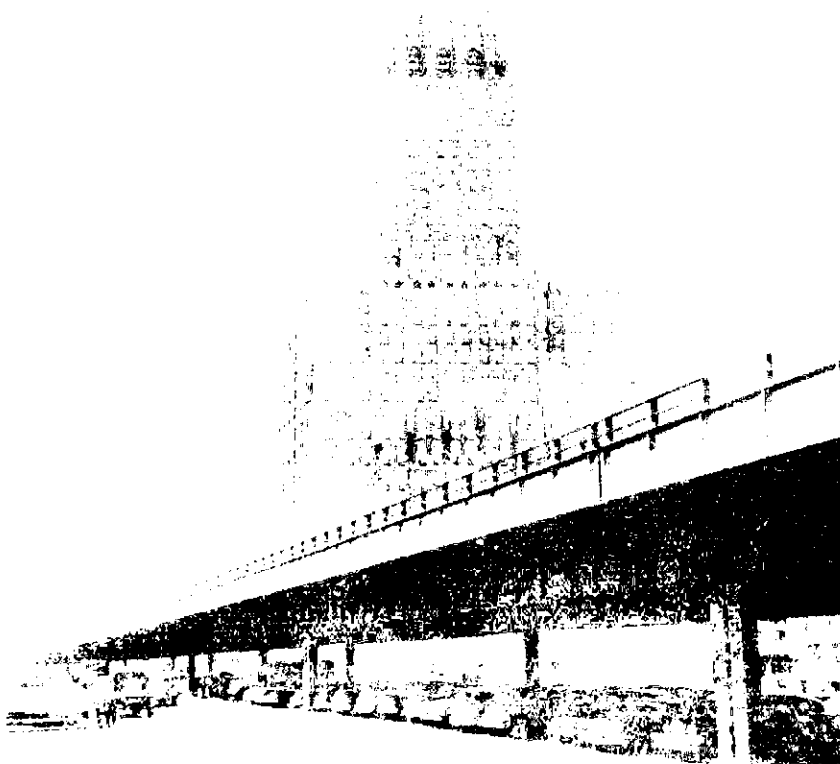
Racial Composition

Of the three and a half million residents of New York City, at the time of the 1900 Federal Census, 60,666 were Negroes. The other colored, mostly Orientals, numbered only 6,638. The white population besides the 2,108,980 native-born included 1,260,918 foreign-born, the latter comprising more than a third of the entire population of the city. The largest number of the foreign-born white, namely 322,343, were from Germany, followed by 275,102 born in Ireland. Some 317,000 had been born in Russia, Poland, Austria-Hungary and Roumania; the majority of them were Jews.



New York's Changing Scene*

WEST STREET: (upper) About 1887, looking north at Vesey Street; (lower) today, elevated highway and New York Telephone Company building cuts space and crowds sky. *Reproduction by courtesy, Seidman Photo and New York Daily News.



Other foreign-born whites then residing in New York City also included 145,433 born in Italy; 80,000 from either England, Wales or Scotland. Lesser numbers had come from Sweden, France, or from Canada.

In 1900, the age composition of the population was quite different from what it is now (see p. 4). At that time nearly a third or 30.7 percent was made up of children under fifteen years of age; old folks, sixty-five and over, comprised only 2.8 percent of the population. Nowadays the proportion of the child population has been reduced by a third from what it was previously, and that of the aged is two and a half times as great. The latter now comprises 7.7 percent of the entire population.

During the first half of the twentieth century the great metropolis of the New World, New York City, continued to grow at a varying pace. The greatest gain in population was made during the first decade when its inhabitants increased in number from some 3,400,000 to 4,800,000, actually by 1,329,681, an increase of no less than thirty-nine percent. Between 1910 and 1920 growth was at a lesser rate; the population increased by 853,165 or by eighteen percent. The decade of 1920 to 1930 saw again an increased rate of gain, the population growing by no less than 1,310,000 or by twenty-three percent. The effect of Federal legislation restricting immigration soon began to be felt and between 1930 and 1940 the gain in population totalled only 524,549, an increase of but 7.6 percent. It was even less in the last decade of that first half of the century; between 1940 and 1950, the population increased by 436,962 or by slightly less than six percent.

As a result of the great gain in population during the first decade, the proportion of the foreign-born residing here in 1910 reached forty percent of the entire population; they then numbered almost two million. The composition of the foreign-born group at that time began to show different proportions. There was a comparative reduction in the number of those born in Ireland or Germany. Those from Italy were now two and a half times more numerous than ten years previously. There were now 340,770 foreign-born Italians here. Those from Russia were almost three times the number they were ten years before; those from Austria-Hungary doubled; likewise those from Poland. Negroes numbered 91,709 in 1910.

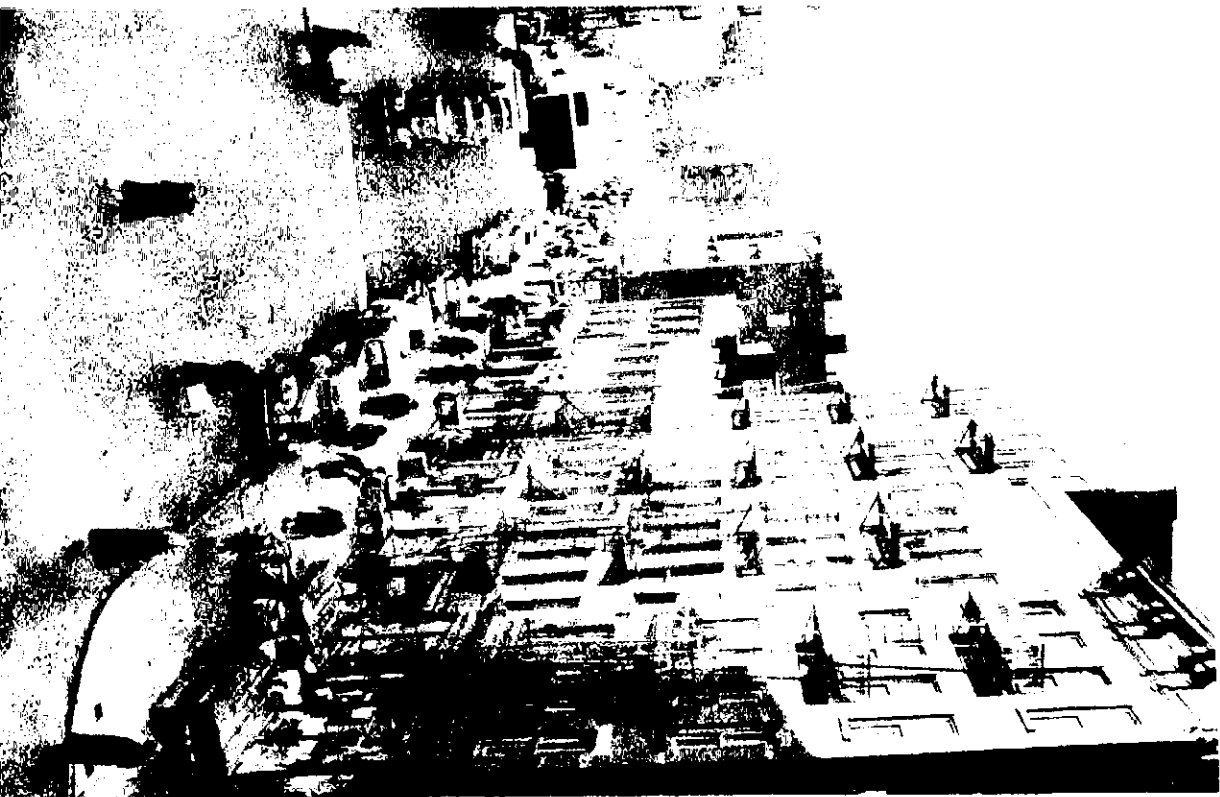
In 1920 those residents of New York born in Russia, 487,275, represented the largest number of the foreign-born. In addition there were 157,000 from Austria; 146,000 from Poland; and 65,000 from Hungary. That year Negroes in New York City numbered 152,467.

In 1920, the proportion of the population which was foreign-born was reduced to 35.6 percent of the total; in 1930, it represented 33 percent; in 1940, 28 percent; and, by 1950, it was now down to 23 percent. In 1950, New York's foreign-born white numbered 1,784,089, and the native-white 5,332,027. There were now 747,780 Negroes and 28,028 "other colored", mostly Orientals.

The first half of the twentieth century had seen the population of New York grow to more than double, namely, from some 3,500,000 inhabitants to nearly 8,000,000, not to mention the extreme growth which the surrounding suburban areas of Long Island, New York State and New Jersey have also witnessed.

NEW YORK'S CHANGING SCENE*

HURSTER STREET: (left) About 1900, in heart of lower East Side; (right) today, automobiles have displaced pushcarts. *Reproduction by courtesy, New York Historical Society and New York Daily News.



During those fifty years a remarkable development in transportation facilities had perforce taken place. The barriers created by the surrounding waters of the East River, the Hudson and the Harlem River, around Manhattan had been bridged over or had seen a series of tunnels dug under them. Between 1900 and 1910 alone in addition to the already existing Brooklyn Bridge there were erected the Williamsburg, the Queensboro, and the Manhattan bridges across the East River. Over to New Jersey was opened in 1927 the Holland Tunnel; in 1931 was erected the George Washington Bridge; finally, in 1937, the Lincoln Tunnel. More recently, the Triboro Bridge linked Manhattan, Bronx and Queens. Tunnels over to Queens have also been dug under the East River; likewise in 1950 between the Battery and Brooklyn. At the same time a number of important lines for rapid transit were built, not to mention already existing "elevated" lines.

During the fifty years under consideration, the internal growth of the city was not at an even rate. Manhattan, at the turn of the century, was already crowded. As a result between 1900 and 1950 its population increased from 1,854,052 to 1,961,856 or by 107,804, the least of any of the five boroughs of New York City. Numerically the next important increase was on Staten Island where the population, increasing by 125,000, trebled. Brooklyn came along with an increase of 1,570,000 in population; in 1950 the number of its inhabitants, 2,739,000 was 1.7 times what it was in 1900.

It is particularly in the boroughs of the Bronx and of Queens that the major growth of New York City took place, especially when rapid transit lines made these areas more accessible. In the Bronx the population increased by 1,250,000, namely, from 201,646 to 1,452,691--seven times as large in 1950 as it was in 1900. Finally there has been the unusual and remarkable growth in the Borough of Queens, said to be the fastest growing section of the United States. Between 1900 and 1950 it registered an increase of no less than 1,403,000, so that lately its total population, 1,557,179, is ten times what it was originally when it was scattered mostly in small disconnected communities.

In relation to the land area of the great city, the density of the population per square mile in 1950 averaged 25,120; it was least on Staten Island, 3,180 per square mile only. Queens, even with its very great growth, but because of its larger size, had a density of population of 13,850 per square mile in 1950. In the Bronx, the density was 33,440; in Brooklyn, it was 36,030. Finally, in Manhattan, the density of population per square mile was 87,900, barely five thousand more than fifty years previously.

Changes in Racial Composition

Great and significant changes in the white and non-white composition of the city have taken place particularly during the last decade.

Between 1940 and 1950, the white population of the city as a whole increased by 2.0 percent only; in the boroughs of Manhattan, the Bronx and Brooklyn it actually decreased. The non-white population

during the decade just mentioned rose from 477,494 to a total of 775,753, an increase of nearly three hundred thousand or of 62 percent. In Manhattan the non-white population increased by 29 percent; on Staten Island, by 54 percent; in Brooklyn, by 93 percent; in Queens, by 99.7 percent; and, in the Bronx, by no less than 310 percent. The colored population was now distributed as follows: 5,492 resided on Staten Island, 53,723 in the Borough of Queens; 100,048 in the Bronx; 212,989 in Brooklyn; finally 403,501 in Manhattan (see p.5).

With regard to concentration, the last Census enumeration indicates that in the Borough of Queens some 30,000 resided in the Jamaica-East Section and 11,757 in the Corona Section. In the Bronx there were 18,145 in the Mott Haven District and 68,220 now in Morrisania. Relatively small numbers resided in the other Bronx districts; however, there were 7,106 in Tremont. In Brooklyn, first of all the non-white population was largest in the Bedford District with 124,501 residents, followed by 41,081 in the Fort Greene District. In Brownsville there were 18,435 and both in Bushwick and Red Hook-Gowanus about 7,500 each. In the Borough of Manhattan, both in the Lower East Side and the Lower West Side there were nearly equal numbers, around 13,000 in each. The non-white population in East Harlem numbered 38,199; in the Riverside District, 52,545; in the Washington Heights section 77,801; and, in Central Harlem, 205,442.

During the last decade there has also been a large influx of Puerto Ricans into New York City. Official figures of their number have not been published, but studies of the Federal Census records by the Welfare and Health Council of New York City show in 1950 that there were here approximately some 246,000 people who were born in Puerto Rico or of Puerto Rican parentage; their number has greatly increased since.

The vast horde and streams of population which have gone through and into New York during the fifty years under consideration, the type and composition of these groups, the limited space available to them for dwelling purposes have all combined to make extremely difficult the control of a communicable disease like tuberculosis.

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New York's Changing Scene*
MADISON SQUARE AREA: (upper) Early 1900s, Madison Square Garden, statue of Diana tops edifice; (lower) today, massive buildings of Metropolitan and New York Life insurance companies overshadow New York Court of Appeals.*Reproduction by courtesy, New York Daily News.



HEALTH CONDITIONS AND CHANGES, 1900-1950

DURING the first half of the twentieth century New York City reflected sharply the dramatic gains in health which have been made in recent times. The reports to be quoted are all the more striking when it is recalled, first, that it is especially in large and dense centers of population that opportunities for the spread of communicable diseases are greatest. Secondly, the competition for space and a living is here likewise of the most intensive character. Finally, since food unlike in rural areas must all be purchased and come from afar, the maintenance of good nutrition and health under these conditions is of greater difficulty than elsewhere.

Mahoney(3), the Commissioner of Health of the City of New York, in his report "New York City's Health in 1950", has well summarized the changes and the tremendous advances which have been made. "An indication", says he, "of some of the achievements of preventive medicine and public health in New York City during the past half century can be obtained by contrasting the vital statistics of 1900 and 1950. Among the most dramatic accomplishments were tremendous reductions in infant and maternal mortality; the conquest of such communicable diseases as smallpox, typhoid fever, diphtheria, malaria and scarlet fever. Rapid strides were made toward the conquest of venereal diseases. Significant also was the reduction of mortality from tuberculosis, pneumonia, and appendicitis.

"In 1900, the general death rate was 20.6 per thousand population. At the same time the birth rate was 35.7 and the infant mortality rate, 135 per thousand births."

In 1950, the general death rate of ten was only one-half of what it was formerly. And whereas the average age at death at the beginning of the century was 30.2 years for both sexes, it has risen, in fact, doubled to 60.2 in 1950, the gain having been continuous during that period.

Since 1900 the birth rate has fallen gradually until by 1950 it averaged 19.7 per thousand. It varies sharply in the two largest racial groups now residing in New York City: the whites and the Negroes. The birth rate of the white population in 1950 was only 18.7 and that of the Negroes 28.6. In 1910 the white population had a natural rate of increase of 14 per thousand population since at that time its birth rate was 30 and its death rate 15.9, but in 1950 the natural increase, even with the much lower general death rate of the white population, had been reduced to 8.7.

In 1910 the Negro birth rate in New York City was 24.1 per thousand but its death rate was almost as high, 24.7. Living conditions were particularly hard for them in this already congested city. But in 1950, when the Negro birth rate was 28.6, their general death rate had come all the way down to 9.63, which meant that their natural rate of increase was now 18.9, or more than double that of the white population. These reports testify to the fact that the capacity for improvement in health

LEADING CAUSES OF DEATH, NEW YORK CITY
1900, 1910, 1920, 1930, 1940 AND 1950

Year 1900			
Rank	Cause of Death	Deaths	Rate*
1	Pneumonias	10,482	304
2	Tuberculosis	9,630	280
3	Diarrhea, enteritis	6,830	198
4	Bright's, nephritis	5,362	156
5	Pre.-birth, debility	4,801	139
6	Heart diseases	4,069	118
7	Accidents	3,012	87
8	Cer. hem., arter'l dis.†	2,482	72
9	Cancer	2,291	66
10	Diphtheria, croup	2,277	66
-	Other causes	19,636	571
Deaths, all causes		70,872	2057
population: (3,446,042)			
Live births		123,000	35.7‡
Infant mortality		16,640	135.3+

Year 1920			
Rank	Cause of Death	Deaths	Rate*
1	Heart diseases	12,117	213
2	Pneumonias	10,058	177
3	Tuberculosis	7,135	126
4	Cancer	5,317	94
5	Bright's, nephritis	4,833	85
6	Pre.-birth, debility	3,631	64
7	Accidents	3,619	64
8	Cer. hem., arter'l dis.†	3,542	62
9	Influenza	3,492	61
10	Diarrhea, enteritis	2,926	51
-	Other causes	16,579	292
Deaths, all causes		73,249	1289
population: (5,683,765)			
Live births		132,856	23.4‡
Infant mortality		11,340	85.4+

Year 1940			
Rank	Cause of Death	Deaths	Rate*
1	Heart diseases†	26,529	355
2	Cancer	12,310	165
3	Cer. hem., arter'l dis..	4,771	64
4	Accidents	3,885	52
5	Tuberculosis	3,627	49
6	Nephritis	3,545	47
7	Pneumonias	3,410	46
8	Diabetes	3,106	42
9	Pre.-birth, debility	2,651	36
10	Suicide	1,263	17
-	Other causes	10,911	145
Deaths, all causes		76,008	1,018
population: (7,465,919)			
Live births		107,287	14.4‡
Infant mortality		3,746	34.9+

Year 1910			
Rank	Cause of Death	Deaths	Rate*
1	Pneumonias	10,519	220
2	Tuberculosis	10,074	211
3	Heart diseases	8,350	174
4	Diarrhea, enteritis	6,370	133
5	Bright's, nephritis	5,638	118
6	Pre.-birth, debility	4,655	97
7	Cancer	3,710	78
8	Accidents	3,527	74
9	Cer. hem., arter'l dis.†	2,852	60
10	Diphtheria, croup	1,715	36
-	Other causes	19,332	403
Deaths, all causes		76,742	1604
population: (4,785,535)			
Live births		143,000	29.9‡
Infant mortality		16,215	113.4+

Year 1930			
Rank	Cause of Death	Deaths	Rate*
1	Heart diseases	17,786	256
2	Cancer	8,125	117
3	Pneumonias	8,058	116
4	Cer. hem., arter'l dis.†	5,231	75
5	Tuberculosis	5,089	73
6	Accidents	4,868	70
7	Pre.-birth, debility	3,173	46
8	Nephritis	2,905	42
9	Diabetes	1,784	26
10	Suicide	1,403	20
-	Other causes	16,466	238
Deaths, all causes		74,888	1079
population: (6,943,560)			
Live births		122,811	17.7‡
Infant mortality		7,030	57.2+

Year 1950			
Rank	Cause of Death	Deaths	Rate*
1	Heart diseases†	34,652	438
2	Malignant neoplasm(cancer)	14,632	185
3	Cer. hem., (vasc.les.C.N.S.)	5,168	65
4	Pre.-birth, dis.infancy.	3,369	43
5	Accidents	3,252	41
6	Pneumonias	2,394	30
7	Tuberculosis	2,321	29
8	Liver, gallbladder, pancreas	1,789	23
9	Diabetes	1,584	20
10	Dis. arteries	1,216	15
-	Other causes	8,705	112
Deaths, all causes		79,082	1001
population: (7,902,881)			
Live births		155,818	19.7‡
Infant mortality		3,858	24.8+

*Per 100,000 population. †Inclusive of diseases of coronary arteries. ‡Per 1,000 population. +Per 1,000 live births. Note: Deaths in 1950 classified according to 6th rev. Inter. List Causes of Death. Based on reports, Bureau of Records and Statistics, Department of Health, City of New York.

It is especially in the field of communicable diseases that some of the greatest advances in saving lives have been made. Smallpox which still accounted for 410 deaths in 1901 and 310 in 1902 has since been wiped out. Typhoid fever which killed 718 persons in 1900 took only one life in 1950. Malaria and erysipelas which took only one person recently, killed 532 in 1900. Ravages from pneumonia and the reduction lately have been mentioned above.

Specific factors mentioned by Mahoney "which have brought about these remarkable changes can be classified under (1) environmental sanitation, (2) specific immunization, and (3) specific therapy.

"Improvements in environmental sanitation included purification of the city's water and milk supplies. In 1910 chlorination of water was introduced and in 1912 pasteurization of milk. In addition has been the attention given to the protection of the purity of foods and drugs."

With regard to specific immunization mention must be made particularly of the conquest of diphtheria; likewise the widespread vaccination which during the past fifty years has wiped out smallpox.

"The specific drugs, ranging from salvarsan to the most recent antibiotics, are the latest means for the control of communicable diseases. The introduction of the sulfonamides in 1934 and of penicillin a decade later opened a new era in medication."

In 1950 the degenerative conditions peculiar naturally and more to the older section of the population head the mortality returns. Heart diseases, cancer, cerebral hemorrhage are responsible now for more than half of all the mortality.

The gains in lives saved can be measured in a way from the previous statement that the average age at death in New York City has doubled. A few comparative figures for the United States frame the picture interestingly. Whereas at the beginning of the century the expectation of life at birth averaged 49 years it has now risen to practically 69 years-- a gain for all, of twenty years; the improvement has even been slightly greater in the female sex.

While as previously mentioned it is particularly children who have benefited most by having the opportunity to live their lives through, it is worth noting that even at the older periods of life there has been an improvement in the expectation of life. For those aged twenty, in the United States in the white population, the expectation of life has risen from 42 years to 49 years; for those forty years of age, a rise from 27.7 more years to 30.7. Even for those over sixty-five, a slight gain of one year in life expectancy has been recorded, the expectation being approximately some twelve years to be added onto their present age.

During the half century under review while the customary epidemics among children have occurred their severity as previously mentioned, has been greatly reduced. However, during those fifty years there have been other epidemics due to virus infections. Poliomyelitis struck severely in 1916 when among some nine thousand reported cases there were 2,448

LEADING CAUSES OF DEATH AMONG WHITE POPULATION, NEW YORK CITY
1910, 1920, 1930, 1940 AND 1950

Year 1910				Year 1920			
Rank	Cause of Death	Deaths	Rate*	Rank	Cause of Death	Deaths	Rate*
1	Pneumonias	10,128	216	1	Heart diseases	11,738	213
2	Tuberculosis	9,507	203	2	Pneumonias	9,374	170
3	Heart diseases	8,144	174	3	Tuberculosis	6,488	118
4	Diarrhea, enteritis	6,207	132	4	Cancer	5,210	94
5	Bright's, nephritis	5,456	116	5	Bright's, nephritis	4,688	85
6	Pre.-birth, debility ...	4,502	96	6	Accidents	3,498	63
7	Cancer	3,650	78	7	Pre.-birth, debility ...	3,433	62
8	Accidents	3,450	74	8	Cer.hem.,arter'1 dis.†..	3,426	62
9	Cer.hem.,arter'1 dis.†..	2,793	60	9	Influenza	3,379	61
10	Diphtheria, croup	1,698	36	10	Diarrhea, enteritis	2,803	51
-	Other causes	18,795	401	-	Other causes	15,833	288
	Deaths, all causes	74,330	1586		Deaths, all causes	69,870	1267
	Population, 4,686,439				Population, 5,514,404		
	Live births	140,736	30.0‡		Live births	128,646	23.3‡
	Infant mortality	15,680	111.4+		Infant mortality	10,667	82.9+
Year 1930				Year 1940			
Rank	Cause of Death	Deaths	Rate*	Rank	Cause of Death	Deaths	Rate*
1	Heart diseases	16,926	257	1	Heart diseases†	25,154	360
2	Cancer	7,866	119	2	Cancer	11,721	168
3	Pneumonias	7,283	110	3	Cer.hem., arter'1 dis..	4,487	64
4	Cer.hem., arter'1 dis.†	5,000	76	4	Accidents	3,602	52
5	Accidents	4,516	68	5	Nephritis	3,234	46
6	Tuberculosis	4,072	62	6	Pneumonias	3,100	44
7	Pre.-birth, debility ..	2,891	44	7	Diabetes	2,972	43
8	Nephritis	2,695	41	8	Tuberculosis	2,640	38
9	Diabetes	1,713	26	9	Pre.-birth, debility ..	2,350	34
10	Suicide	1,351	20	10	Suicide	1,229	18
-	Other causes	15,117	229	-	Other causes	10,591	151
	Deaths, all causes	69,430	1052		Deaths, all causes	71,080	1018
	Population, 6,596,982				Population, 6,980,974		
	Live births	115,114	17.4‡		Live births	99,005	14.2‡
	Infant mortality	6,299	54.7+		Infant mortality	3,293	33.3+
Year 1950							
Rank	Cause of Death	Deaths	Rate*				
1	Heart diseases†	32,364	455				
2	Malignant neoplasm(cancer)	13,574	191				
3	Cer.hem.(vasc.les.C.N.S.)	4,771	67				
4	Accidents	2,852	40				
5	Pre.-birth,dis.infancy..	2,647	37				
6	Pneumonias	2,036	29				
7	Tuberculosis	1,604	23				
8	Liver,gallbladder,pancreas	1,638	23				
9	Diabetes	1,465	21				
10	Dis. arteries	1,121	16				
-	Other causes	8,483	103				
	Deaths, all causes	71,555	1005				
	Population, 7,119,901						
	Live births	133,340	18.7‡				
	Infant mortality	2,992	22.4+				

*Per 100,000 White population as of July 1st.

†Inclusive of diseases of coronary arteries.

‡Live births per 1,000 White population.

#Includes a few "other colored".

+Infant deaths per 1,000 live births.

Note: Death in 1950 classified according to 6th rev. Inter. List Causes of Death. Based on reports, Bureau of Records and Statistics, Department of Health, City of New York.

LEADING CAUSES OF DEATH AMONG NEGRO POPULATION, NEW YORK CITY
1910, 1920, 1930, 1940 AND 1950

Year 1910				Year 1920			
Rank	Cause of Death	Deaths	Rate*	Rank	Cause of Death	Deaths	Rate*
1	Tuberculosis	522	561	1	Pneumonias	663	412
2	Pneumonias	384	413	2	Tuberculosis	596	370
3	Heart diseases	198	213	3	Heart diseases	355	221
4	Bright's, nephritis	174	187	4	Pre.-birth, debility ...	189	117
5	Diarrhea, enteritis	162	174	5	Diarrhea, enteritis	120	75
6	Pre.-birth, debility ...	153	164	6	Accidents	115	71
7	Accidents	72	77	7	Cer.hem.,arter'l dis.†..	112	70
8	Cancer	59	63	8	Influenza	102	63
9	Cer.hem.,arter'l dis.†..	57	63	9	Cancer	100	62
10	Bronchitis	51	55	10	Whooping cough	46	29
-	Other causes	469	505	-	Other causes	816	506
	Deaths, all causes	2303	2475		Deaths, all causes	3214	1996
	Population, 93,038				Population, 160,988		
	Live births	2245	24.1‡		Live births	4129	25.6‡
	Infant mortality	535#	238.3+		Infant mortality	677	164.0+

Year 1930				Year 1940			
Rank	Cause of Death	Deaths	Rate*	Rank	Cause of Death	Deaths	Rate*
1	Tuberculosis	971	293	1	Heart diseases†	1342	288
2	Heart diseases	839	253	2	Tuberculosis	929	199
3	Pneumonias	756	228	3	Cancer	569	122
4	Accidents	335	101	4	Syphilis	350	75
5	Pre.-birth, debility ...	279	84	5	Nephritis	305	65
6	Cancer	245	74	6	Pneumonias	300	64
7	Cer.hem.,arter'l dis.†..	220	66	7	Pre.-birth,dis.infancy..	292	63
8	Nephritis	206	62	8	Accidents	272	58
9	Syphilis	204	62	9	Cer.hem.,arter'l dis. ...	268	58
10	Homicide	104	31	10	Diabetes	129	26
-	Other causes	1542	468	-	Other causes	860	188
	Deaths, all causes	5265	1591		Deaths, all causes	5616	1206
	Population, 330,975				Population, 465,673		
	Live births	7537	22.8‡		Live births	8081	17.4‡
	Infant mortality	722	95.8+		Infant mortality	441	54.6+

Year 1950			
Rank	Cause of Death	Deaths	Rate*
1	Heart diseases†	2224	295
2	Malignant neoplasm(cancer)	1007	133
3	Pre.-birth,dis. infancy..	709	94
4	Tuberculosis	683	90
5	Cer.hem.(vasc.les.C.N.S.)..	389	52
6	Accidents	385	51
7	Pneumonias	348	46
8	Homicide	163	22
9	Diabetes	114	15
10	Syphilis	104	14
-	Other causes	1146	151
	Deaths, all causes	7272	963
	Population, 754,849		
	Live births	21,568	28.6‡
	Infant mortality	866	40.2+

*Per 100,000 Negro population as of July 1st.

†Inclusive of diseases of coronary arteries.

‡Live births per 1,000 Negro population.

#Included are few "other colored".

+Infant deaths per 1,000 live births

Note: Deaths in 1950 classified according to 6th rev. Inter. List Causes of Death. Based on reports, Bureau of Records and Statistics, Department of Health, City of New York.

deaths. In 1931 another "polio" epidemic also caused 504 deaths. There seems to have been a slight recurrence lately when in 1949 among some twenty-four hundred cases, 186 deaths occurred. There was, we must remember, in 1918 the pandemic influenza which struck with particular severity here and was responsible for 12,562 deaths.

Reference has been made previously to differences in the natural increase of population among the white and Negro residents of New York City. Records are available separately for each of the two groups as to leading causes of mortality beginning in 1910. At that time the Negro community already numbered 93,038. By 1950 it had risen to more than 750,000, undoubtedly the largest urban concentration of Negroes in any place. It is therefore of special interest to see the changes in the health records of the two groups during that period, when as previously mentioned the Negroes have made great health gains.

White, Negro, Principal Causes of Death

In 1910, the general death rate of the white population was 15.86 per thousand population and in 1950 it was down to 10.05. Formerly, the principal causes of death were in this order; first, pneumonia; second, tuberculosis; third, heart diseases; fourth, diarrhea and enteritis. It is worth noting that even at that time the death rate from accidents was 74 or almost twice what it is even these days. The infant mortality rate in the white population was 111 per thousand births, whereas in 1950 it was down to 22. Leading causes of death in 1950 in the white population were first heart diseases; second, cancer; third, cerebral hemorrhage; and, fourth, accidents. Tuberculosis from second place in 1910 has come down to seventh place.

In the Negro community in 1910, the general death rate was 24.75 per thousand and the infant mortality rate 238 per thousand births, whereas in 1950 the death rate was down to 9.63 and the infant mortality to 40. The slightly lower general death rate of the Negro population recently as compared with that of the white is due to the difference in the age composition of the two, the first being still a comparatively younger group and the other including a large proportion of the aged.

Among Negroes in 1910, the leading causes of death were first, tuberculosis; second, the pneumonias; third, heart diseases. In 1950 the order was changed and the list was headed by heart diseases followed by cancer and then, among children, pre-maturity and diseases of early infancy. Tuberculosis is now down to fourth place. The death rate from tuberculosis which in 1910 was no less than 561 per hundred thousand population, has now been brought down to 90.

* * *

LEADING CAUSES OF DEATH, BY RACE AND SEX, NEW YORK CITY, 1950

Cause of Death*	Deaths										Death rate per 100,000						Rate All Races
	Total Deaths	White		Nonwhite		All Races	White			Nonwhite							
		Both Sexes	Male	Female	Both Sexes		Male	Female	Male Rate	Female Rate	Both Sexes	Male Rate	Female Rate				
1 Heart diseases	34,652	32,364	18,532	13,832	2,288	1,112	1,176	438	455	534	379	292	315	273			
2 Malign. neoplasm (cancer) ..	14,632	13,574	7,129	6,445	1,058	521	537	185	191	205	177	135	148	125			
3 Cerebral hemorrhage ...	5,168	4,771	2,212	2,559	397	161	236	65	67	64	70	51	46	55			
4 Pre-birth, dis. infancy ..	3,369	2,647	1,516	1,131	722	415	307	43	37	44	31	29	23	27			
5 Accidents	3,252	2,852	1,810	1,042	400	282	118	41	40	52	29	46	60	34			
6 Pneumonia	2,394	2,036	1,181	855	358	211	147	30	29	34	9	92	129	61			
7 Tuberculosis	2,321	1,604	1,262	342	717	456	261	29	23	29	17	19	26	13			
8 Liver, gallbladder, panc.	1,789	1,638	1,000	638	151	93	58	20	23	16	25	15	12	18			
9 Diabetes	1,584	1,465	551	914	119	42	77	15	16	16	16	12	12	12			
10 Dis. arteries	1,216	1,121	549	572	95	44	51	12	12	17	8	7	10	4			
11 Suicide	938	885	602	283	53	37	16	15	16	16	16	12	10	11			
12 Hernia, intest., perit. .	665	601	315	286	64	34	34	8	8	9	8	8	9	8			
13 Dis. stomach, duodenum ..	626	586	478	108	40	34	6	8	8	14	3	5	10	1			
14 Hypertension	583	493	247	246	90	42	48	7	7	7	7	11	12	11			
15 Nephritis	555	475	263	212	80	37	43	7	7	8	6	10	10	10			
16 Homicide	329	163	130	33	166	131	35	4	2	4	1	21	37	8			
17 Benign neoplasm	322	278	119	159	44	10	34	4	4	3	4	6	3	8			
18 Alcoholism	295	218	174	44	77	62	15	4	3	5	1	10	18	3			
19 Prostate, hyperplasia ..	274	256	256	...	18	18	...	7	7	7	...	5	5	...			
20 Syphilis	264	156	135	21	108	77	31	3	2	4	1	14	22	7			
21 Appendicitis	190	163	101	62	27	11	16	2	2	3	2	3	3	4			
22 Poliomyelitis	73	71	43	28	2	1	1	1	1	1	1	0.3	0.3	0.2			
-- Other (remaining) causes	3,591	3,138	1,778	1,360	453	218	235	45	40	67	37	56	62	56			
All causes	79,082	71,555	40,383	31,172	7,527	4,045	3,482	1001	1005	1163	855	961	1147	809			

*Classified according to 6th rev. (1948) Inter. List Causes of Death: (1) Diseases of the heart 410-443; (2) malignant neoplasms, neoplasms of lymphatic and hematopoietic tissues 140-205; (3) vascular lesions affecting central nervous system 330-334; (4) congenital malformations 750-759; certain diseases of early infancy 760-776; (5) accidents 800-962; (6) pneumonia, all forms 490-493; (7) tuberculosis, all forms 1-19; (8) diseases of liver, gallbladder and pancreas 580-587; (9) diabetes mellitus 260; (10) diseases of arteries 450-456; (11) suicides 963, 970-979; (12) hernia and other diseases of intestines and peritoneum 560-578; (13) diseases of stomach and duodenum 540-545; (14) hypertension without mention of heart 444-447; (15) nephritis and nephrosis 590-594; (16) homicides 964, 980-985; (17) benign neoplasms 210-229, neoplasm of unspecified nature 230-239; (18) alcoholism 322; (19) hyperplasia of prostate 610; (20) syphilis and its sequelae 20-29; (21) appendicitis 550-553; (22) acute poliomyelitis 80, late effects of acute polio. 81. †Rate based on male population.

MILESTONES IN THE PROGRESS AGAINST TUBERCULOSIS

BECAUSE of the widespread incidence of tuberculosis, its communicable character, and the influence upon infection and disease of both personal and environmental conditions, the fight against it has had to be led from a variety of approaches, specific and general.

Following the identification of the cause of tuberculosis by Koch through his discovery of the tubercle bacillus in 1882, it became obvious that the first approach towards its control would be the identification and location of cases of tuberculosis, the possible foci of new infections. These characteristics and aspects of the situation were keenly realized in New York City by Biggs who led in securing the adoption in 1894 of the resolution by the Board of Health providing for the reporting of cases, the free examination of sputum, and the home visiting of consumptives. By 1897 the Sanitary Code required the universal reporting of tuberculosis cases including those under the care of medical practitioners.

In 1901 the Board of Health adopted a regulation to permit the compulsory segregation of recalcitrant cases of tuberculosis; the effectiveness of this measure was limited greatly by the lack of special wards or buildings where such cases could be isolated. Ultimately it was realized that educational methods were more effective in securing the consent of patients to go to institutions than police measures.

An important step at that time was the enactment of the Tenement House Law of 1901 which had a wide influence on the type of construction where large numbers of people were being housed. In crowded sections there were numerous habitations used where some of the rooms had no access to air or light. In these dark ill-ventilated places where there were cases of tuberculosis the chances for spread were greatly heightened. The Tenement House Law just mentioned marked a new epoch in tenement house reform. Conditions under which new tenement houses could be built were prescribed; in existing buildings alterations were required to make them habitable and decent. The character of official inspections of old and new houses was defined; the following conditions were declared illegal: inadequate lighting, ventilation or water supply; insufficient facilities for escape in case of fire and improper sanitary equipment. A new Municipal Department responsible for the enforcement of the Tenement House laws was created.

Beginning in 1902 inspectors of the country staff of the Department of Health were assigned to posts in the city's milkshed to ascertain sanitary condition of dairies, methods of handling and transporting milk to the city. These steps, along with those already in effect within the city to assure purity and cleanliness of the milk supply, had an important influence especially on child health.

Tuberculosis Hospital Facilities

For some time prior to the beginning of the twentieth century, especially following the opening of the Adirondack Cottage Sanitarium



New York's Changing Scene*

SAN JUAN HILL AREA: (upper) Old law tenements, West 62nd Street;
(lower) Amsterdam Houses, West Sixties. *Reproduction by courtesy,
New York City Housing Authority.



by Trudeau, there had been recognition of the importance of hospital or sanatorium treatment of tuberculosis especially where opportunities for rest and enjoyment of fresh air were provided. Already by that time there existed in New York City important institutions such as the Brooklyn Home for Consumptives, St. Joseph's Hospital in the Bronx for the same type of patients, Seton Hospital, the Montefiore Country Sanatorium at Bedford Hills, and other well-known out-of-town sanatoria such as the Loomis Sanatorium in the Catskills, and Gabriels in the Adirondacks. Then, within the city, in some of the municipal institutions, a number of beds, or a few wards, were already being reserved for consumptive patients, as, for instance, at Kings County Hospital, at St. Luke's Hospital, at the Montefiore Home, at the Home for Incurables, at the Lincoln Hospital and Home of the City of New York.

Shortly thereafter a number of important institutions began to be made available for tuberculosis patients. In 1902, the first Tuberculosis Division in a city institution was opened at the Metropolitan Hospital. In 1903, the Department of Health opened the Riverside Hospital for the Tuberculous on North Brother Island; it was designed primarily for wilfully careless consumptives under forcible detention. The same year saw the opening in the Adirondacks of the private sanatorium, Stony Wold, particularly for girls and women patients. Likewise, in the "North Woods", was opened the important State Hospital for Incipient Tuberculosis at Ray Brook. While the latter took patients primarily from other parts of the State, at the same time a number were taken from New York City. The same year saw the interesting provision made by the Association for Improving the Condition of the Poor at Sea Breeze Hospital on Coney Island for the care of children with non-pulmonary forms of tuberculosis: bones and glands. In 1906, the Municipal Sanatorium at Otisville was opened. In 1909 a novel type of institution was opened at Farmingdale, New Jersey: the Tuberculosis Preventorium for Children which also took in cases from New York City. Those admitted were children without open disease who were members of tuberculous families.

Other important institutions, which added much to New York's facilities for the isolation and care of tuberculosis patients, were the large Sea View Hospital on Staten Island which opened in 1913 and provided 763 beds at that time; St. Anthony's Hospital in Queens, opened in 1914; Neponsit Beach Hospital for Children, in 1916; Triboro Hospital, in 1941 and the tuberculosis sections of Manhattan General Hospital in 1949. In several of the institutions mentioned the original bed capacity was enlarged, especially at Sea View.

Voluntary institutions which also added tuberculosis services to their facilities were Lenox Hill and New York hospitals; among public hospitals should be mentioned Bellevue, City Hospital, Harlem, Kingston Avenue, Morrisania and Willard Parker.

The opening of hospitals and sanatoria for the tuberculous had three very important effects: first, by isolating sufferers from a communicable disease they immediately lent protection to the families of these patients and to the community; second, they provided care

for victims of a long-lasting, serious disease; third, particularly for the large numbers of patients ultimately discharged from these institutions with disease arrested or at least quiescent, they had been responsible for the most practical type of health education teaching them the dangers of their infection and instructing them in many ways to take better care of their condition and general health.

One of the important administrative measures which followed from the registration of cases of tuberculosis was the establishment of a tuberculosis roster in New York City which could be kept up to date continuously. On December 31, 1910, for instance, when there were 27,477 cases of pulmonary tuberculosis registered we are able to see that on that day some 3,648 patients already were in institutions within the city. That figure alone gives an idea of the number of beds which had then become available for their care. At the time, particularly by such as could bear the expense, it was deemed important to seek "the cure" in the country. In December of 1910, 2,445 patients were registered as being either in sanatoria out of town or in health resorts. Altogether we see here therefore that, of the total 27,500 cases in New York City, slightly over 6,000 patients were segregated in institutions or isolated from immediate contact with their family.

Tuberculosis Clinics

Another and very important measure for the control of tuberculosis which began to be developed in the early days of the twentieth century was the care of patients in specialized clinics or dispensaries. In 1903, the first municipally operated tuberculosis clinic in New York City was opened at Gouverneur Hospital, to be followed a few months later by a similar clinic at Bellevue Hospital and the next year by a third clinic operated this time by the Department of Health, the very first in a department of health of any city in the United States. Shortly thereafter a number of similar clinics were opened in private or voluntary hospitals and especially by the Department of Health, until ultimately, such specialized services became available to patients still remaining at home in every section of New York City.

The tuberculosis clinics and dispensary services not only provided places for the examination of tuberculosis suspects by specialists and assured a degree of care to the active cases until they could be placed in institutions but at the same time, through the examination of contacts and especially the visiting of their homes, were responsible for striking at the very source of tuberculosis and permitting a degree of control and prevention that had never been possible previously.

In 1907, the authorities operating the various clinics throughout New York City, whether municipal or under private auspices, formally organized the Association of Tuberculosis Clinics of Greater New York. As a result this type of service was closely coordinated and the experience gained in one or the other was passed on to the entire group. Ultimately special sections for children were opened, likewise evening clinics for working men. There was an avoidance of duplication in the home visiting work of the public health nurses and a systematic transfer



(Upper): MONTEFIORE HOSPITAL Country Sanatorium, Bedford Hills, N.Y.
(Lower): TRIBORO HOSPITAL, Department of Hospitals, City of New York.



of patients so that they could be treated at the clinics nearest to their home. By 1910 no less than 30,406 individuals, active cases of tuberculosis, or members of their families, were under treatment by or under observation at these clinics. From the roster of the Department of Health we are able to see that at the beginning of the year 1910 there were no less than 5,476 cases of tuberculosis under clinic care.

It is worthwhile for a moment to revert to important other developments during that first decade of the half century under consideration. In 1902 was organized the Committee on Prevention of Tuberculosis of the Charity Organization Society of the City of New York which subsequently developed into the New York Tuberculosis and Health Association. In 1904, with headquarters in New York City, was organized the National Association for the Study and Prevention of Tuberculosis. In 1905 the Committee on the Prevention of Tuberculosis of the Brooklyn Bureau of Charities was also formed. It is unnecessary to stress here the importance of the organization of these special voluntary agencies which have now become of such prime importance throughout the United States, their distinctive health education services, their active participation in community case-finding, their support of all worthwhile measures against tuberculosis or for the strengthening of public health facilities.

From the very start the anti-tuberculosis associations realized that public understanding was fundamental for progress and they stressed the importance of popular health education. At the same time they appreciated that facilities had to be at hand and innumerable have been the instances where they organized public sentiment for the provision of adequate hospital facilities and the support of public health departments.

In 1905 a special Tuberculosis Division was opened at Bellevue Hospital. In 1908 was begun the employment of a special social worker in the tuberculosis wards of that institution. Shortly before that time a general Social Service Department had been opened at Bellevue Hospital. Ultimately in all the municipal hospitals it became axiomatic that there should be organized social services in connection with the treatment of patients.

In 1907 the diagnostic tuberculin skin-test was introduced by von Pirquet. Wide-spread use of the tuberculin test demonstrated that one may be infected by the germ and yet not have the disease.

In 1908 took place at the Museum of Natural History the remarkable exhibit of those displays which had been prepared for the International Tuberculosis Congress in Washington. The exhibit had strong popular appeal and did much in those days to familiarize the general population with the character and seriousness of tuberculosis.

The same year, at Bellevue Hospital, was opened the Day Camp for Tuberculosis Patients on the old ferry boat Southfield. Within a few years around that time no less than six similar Day Camps were set up in New York City to provide a measure of care for patients remaining at home. These new facilities included the Middletown Day Camp and

the Rutherford of the Department of Health; the two Day Camps of the Department of Hospitals, the Southfield and the other on the ferry boat at Gouverneur Hospital; likewise, under voluntary auspices, the Vanderbilt Day Camp. Altogether these day camps provided care and opportunities for fresh air and rest to almost 600 patients; they were invaluable to fathers or mothers of families anxious to be home evenings with their children. The cost of their maintenance was also quite low. At the same time they had open-air classes for children from families where there was tuberculosis; in effect they were preventoria.

In 1909 the appropriation of the city to the Division of Communicable Diseases of the Department of Health was increased by some \$230,000, enabling it to extend its tuberculosis control measures. It was therefore possible the next year to increase the public health nursing staff from 23 to 159 and to extend more adequate home visiting service for the tuberculous. It resulted in a tenfold increase of these important visits to the homes of these patients and for the control of tuberculosis in the community. A most important step, by the Board of Health in 1912, resulting in much life-saving among children was the requirement which made compulsory the pasteurization of milk. This had an immediate effect in the reduction of infection and mortality especially from the non-pulmonary form of tuberculosis as well as from other infectious diseases.

Other events of interest in the tuberculosis field during the second decade of the present century was the opening in 1912 of the Victoria Apartments of the Home Hospital conducted by the Association for the Improvement of the Condition of the Poor. There, some twenty families with cases of tuberculosis among their members were provided with unusually salubrious quarters and were under medical and social supervision. It demonstrated that where such facilities are available home treatment of tuberculosis could be successful.

In 1915 the Neponsit Beach Hospital for children suffering from non-pulmonary tuberculosis was taken over by the City of New York. The same year saw the opening of the Altro Workshop, so valuable in the rehabilitation of former sanatorium patients; this distinctive service was rendered by the Committee for the Care of the Jewish Tuberculous.

Anti-Tuberculosis Organizations

In 1919 the former Committee on Prevention of Tuberculosis of the Charity Organization Society became an independent organization, namely, the New York Tuberculosis Association; subsequently when its activities were widened, it became the New York Tuberculosis and Health Association. In 1920 was formed the then Queens Anti-Tuberculosis Association; it became later the Queensboro Tuberculosis and Health Association. In the same year the Richmond County (Staten Island) Tuberculosis Committee became affiliated with the New York Tuberculosis Association. In 1920 also, the latter Association organized a similar Committee for the Bronx; and, in 1922, the important Harlem

Tuberculosis Committee of the New York Tuberculosis Association was formed for special work in that area of the city.

In 1921 the Queens Association was responsible for the organization of the first consultation service in New York City for private physicians' cases. Later this valuable type of service was also provided by the Department of Health at the Bellevue-Yorkville Health Demonstration in 1928. It was only a matter of time afterwards when a score of such valuable services for private physicians' cases were available throughout the city, the great majority of them conducted by the Department of Health.

In 1924, under the leadership of the New York Tuberculosis Association, the Tuberculosis Sanatorium Conference of Metropolitan New York was organized. The Conference membership included two-score institutions with a total bed capacity of nearly ten thousand, wherein more than twenty-three thousand patients are treated annually. Linking the authorities of these key services for the sick, especially at the periodic clinical sessions wherein medical and surgical advances are shared, has had a far-reaching educational value in this area.

In 1931 was organized the Committed on Neighborhood Health Development under the aegis of the Department of Health to consider the possibility of district health centers throughout New York. The practical advantages of such decentralization and of neighborhood service had already been demonstrated at the East Harlem Health Center; likewise, in an experimental brief similar effort by the Department of Health in 1915. Therefore, in 1934, the Department of Health formally organized the Bureau of District Health Administration to bring public health service closer to the people in every part of the city.

In 1932 a relatively economical development in the X-ray examination of large numbers of people marked the opening of the new epoch in tuberculosis case-finding. That year the Queensboro Tuberculosis and Health Association, aided financially in this endeavor by the Metropolitan Life Insurance Company, undertook the periodic X-ray examination of some 10,000 school children. For the first time machinery became available permitting a rapid, less costly method of taking X-ray pictures on a roll of sensitized paper. It was also the first time here that such a large, apparently healthy, group of the population was being examined in that manner. From this time on there have developed these numerous community mass surveys which have rendered such far-reaching service not only in tuberculosis case-finding, but also in the discovery of other abnormal chest conditions. In this city alone the various surveys made possible by these rapid-type of comparatively economical examinations reach more than 600,000 individuals annually.

In 1934 the Department of Health created a separate Bureau of Tuberculosis, thus placing tuberculosis as a major part of its activities. In 1936 all the clinics of the Department of Health were provided with radiographic and fluoroscopic equipment; as a result it became possible to X-ray each new admission to the various chest clinics throughout the city.

In 1939 a requirement was added to the Sanitary Code that a public health nurse should visit all new cases reported including those under the care of private physicians. In 1942 another requirement of the Sanitary Code made it compulsory for all teachers and personnel in elementary schools to have an X-ray examination of the chest upon their appointment and each two years thereafter. In 1949 a B.C.G. vaccination clinic was established by the Department of Health at the Central Harlem Health Center, the first in New York City for the general public.

From an economic standpoint, one of the most important contributions assuring care of the tuberculosis patients in hospitals was the abolition recently by the State Legislature of the so-called "means test" whenever such a case was receiving care in a public institution. This law took effect as of April 1, 1947. It recognized the devastating economic effect of tuberculosis upon the lives of its victims and their families; it assured that he or she could receive the proper care in an institution regardless of ability to pay.

Besides specific anti-tuberculosis measures which were developed for the control of tuberculosis during the first half of the present century, it must be acknowledged that there were a number of improvements of a social character and in working and living conditions of that period that had at the same time an undoubted material influence in curbing the ravages of tuberculosis. We have already mentioned improved housing conditions through the amendment of tenement house laws. To this we should also add the recent and increasing provision of model housing construction to displace particularly dilapidated buildings in slum areas.

During the fifty years under consideration there was also a decisive betterment of working conditions not only with regard to the regulation of measures for hygiene, but especially through shortening of hours of labor, the higher rate of remuneration given nowadays, and the passage of laws providing for the protection of women or minors at work. Also in the fields of public welfare should be mentioned provision of so-called mothers' and widows' pensions in homes where were left dependent children. Finally must be included the wide increase lately in relief provision through the Department of Welfare for financial assistance to the needy.

Eradication of Bovine Tuberculosis

The record of specific measures against tuberculosis would not be complete without mention of the many and, one might even add, successful steps taken over the years by the State of New York, with support of the Federal authorities, towards the eradication of bovine tuberculosis in this area.

As long ago as 1894 claims were accepted by the State of New York for indemnity to owners whose cattle had been killed because of their being diseased. That year the State of New York appropriated \$30,000 for this purpose. It should be recalled that in 1896 Theobald Smith

made his preliminary announcement wherein he pointed out that there were morphological and other differences between the human and bovine tubercle bacillus. He thus proved that the latter causes tuberculosis in cows. It was shown later that it also could cause tuberculosis in man.

Between 1902 and 1906 tuberculin tests by the State Department of Agriculture included 262 herds with a total of 3,088 animals, of which 673 reacted. Animals infected with tuberculosis were found in 121 herds or almost one-half of all tested. Tests for bovine tuberculosis were carried on in a modest way up to 1917, New York State appropriating for tuberculosis indemnity purposes during that period a total of \$1,286,573. In May, 1919, an intensive program under joint State and Federal plans was launched to eradicate the disease.

In 1937, New York State was finally declared as a "modified, accredited state" practically free from bovine tuberculosis. The average infection was reduced from approximately 40 percent in 1919 to less than one-half of one percent when the test was completed on October 1, 1937. During that period no less than 17,798,839 individual tuberculin tests were administered, as a result of which nearly one million (967,624) reacting cattle were eliminated. This testing and re-testing was done among 153,000 herds representing some two million cattle at a cost for indemnity alone of \$57,000,000, of which \$46,000,000 was paid by New York State and \$11,000,000 by the Federal government. This successful accomplishment demanded a sound organization with real teamwork on the part of a legion of workers plus cooperation of Federal officers, County Boards of Supervisors, health agencies and last, but not least, the great army of cattle owners.

Since 1937 the problem has been one of maintaining the freedom of the herds from tuberculosis and the cost has been materially reduced, the State repaying for indemnity purposes up to 1950 a total of slightly over \$3,000,000. In December, 1950, there were under supervision in New York State 116,165 herds containing 1,983,068 head of cattle.

It is particularly childhood which, along with pasteurization of milk as a complementary step, gained the most from this vast program. A reviewer, discussing the decline of tuberculosis in children, well remarked that "tuberculous, crippled, hunchbacks and children with necks scarred from adenitis have become a relative rarity in New York City".

* * *

PREVALENCE OF TUBERCULOSIS, 1900-1950

DURING the fifty years from 1900 to 1949 inclusive, the Department of Health in the City of New York has a record that a grand total of 686,810 new cases of pulmonary tuberculosis were registered by various physicians and institutions (see p.7). It would even be conservative to say that during the first half of the twentieth century at least three-quarters of a million people were attacked by tuberculosis, for the figure just quoted does not include cases of the non-pulmonary type which have never been too carefully reported. Also when notification of tuberculosis in New York City began it took a few years before the importance of registering these cases of a serious communicable disease was generally understood.

The number of new cases of pulmonary tuberculosis registered during each decade were as follows: between 1900 and 1909, a total of 182,184; during the second decade, 211,546; between 1920 and 1930 a total of 119,475. From 1930 to 1940, 98,121 cases were reported; finally, between 1940 and 1950, the number of new cases registered totalled 75,481. It must be observed here that the drop in the new cases has not been at as great a rate as the mortality (see Fig.3).

There are apt to be misunderstandings as to the prevalence of tuberculosis when one pays attention to the death rate only. If we look over a period when tuberculosis registration was better established, let us say for the thirty years between 1920 and 1950, a closer study of the roster of cases, and of the incidence therefore of tuberculosis in general, brings out the inadequacy of the death rate alone as an index. For instance, while between 1920 and 1950 the tuberculosis death rate fell from 126 to 29 per hundred thousand population, or by 77 percent, the registration of new cases of pulmonary tuberculosis totalling 14,035 in 1920 came down to 6,518 in 1950, a reduction of 54 percent, which is much less than that of the death rate alone. The reason is simply this, a mere increase of population necessarily sends down the rate whereas quantitatively the tuberculosis cases of those occurring in the new population add themselves to the cases of the other part of the population. Official authorities concerned with the control of tuberculosis, or the physicians giving care to private patients, or clinics to the supervision of their cases, and finally, hospitals providing beds are not fighting merely the death rate but must face the actual numbers of the patients requiring care.

Manhattan, the "hot bed" of Tuberculosis

The concentration of tuberculosis cases in Manhattan has always been extreme, as one can readily understand, with its high density of population. In 1900 Manhattan had 54 percent of the city's population and 56 percent of the new cases reported that year. During the fifty years under consideration, the proportion of the cases of tuberculosis in that borough has ranged anywhere from 46 percent to 65 percent of the city's cases. In 1950, though its population was now only one-fourth that of the city, it still had 49 percent of the total cases.

CASES OF PULMONARY TUBERCULOSIS IN NEW YORK CITY REGISTERED ANNUALLY SINCE 1898

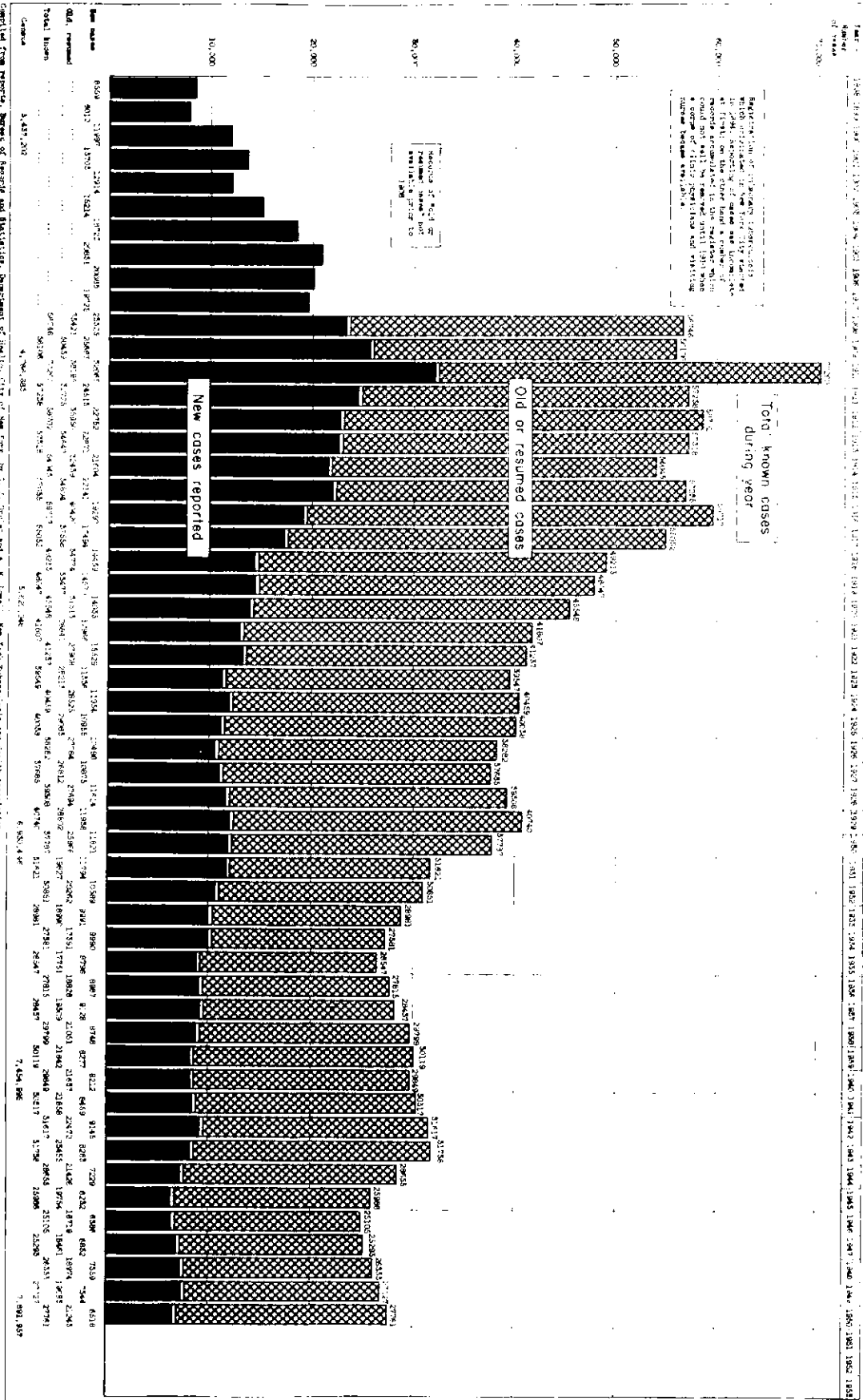


Fig. 3

Source of Reporting

A limited amount of information with regard to the source of reporting of tuberculosis cases in New York City is available for the eight-year period, 1943-1950 (see p. 17). It is illustrative therefore of present conditions. Of 63,297 tuberculosis cases registered during that period, almost half, namely 46 percent, were brought to attention by institutional authorities. Many of the cases had been found in various hospital services, others were registered for the first time by tuberculosis institutions where doubtful cases had come in for observation or even for treatment. Twenty-nine percent of the total cases were reported by clinic authorities, where so many "suspects" or "contacts" come for examination. Only one report out of every seven, or 15 percent, was received directly from medical practitioners. Out-of-town sanatoria, where patients had gone directly for care, reported six percent of the new cases. In other words over half of the cases were reported by institutional authorities. This tends to indicate that it is primarily among the sick that most of the active cases of tuberculosis come to light.

At the moment no exact figures are available with regard to new cases found and reported in the various mass surveys. However, it is important to recall that these mass X-ray surveys are conducted among the apparently healthy population and therefore obviously should not be expected to reveal as much tuberculosis as among people who, for some cause or other, have decided to visit a physician or go to a clinic or are in hospitals for various ailments. As a matter of fact, despite the fact that in New York City in recent years between 500,000 and 600,000 apparently healthy people are X-rayed annually in mass surveys, the observation has been made by competent authorities of the Bureau of Tuberculosis that it is still mostly from the older standard places that the tuberculosis cases are reported.

We must always bear in mind that the assumption that there is a material number of unknown cases in the community is debatable. Such persons as do develop active disease are apt, in most instances, to become aware of pretty definite symptoms; it is only natural to expect that of their own accord, particularly nowadays when health education has been so widespread, diagnostic facilities so readily available, they will seek treatment somewhere and therefore become known and reported.

Unreported Cases

However, there are still a number of cases of active tuberculosis who are in the community and do not come to the attention of the public health authorities for some time. This is particularly illustrated by the fact that, for instance in 1950, an additional 558 cases were identified as existing through death certificates where it was stated that they had died from pulmonary tuberculosis; and, yet, upon checking their names against the tuberculosis rosters they were not found to have been previously registered (see p. 17). This is a serious matter when one considers that these victims of a pro-

gressive communicable disease may have in the meantime been spreading infection particularly among their household or family contacts. During the eight-year period, 1943-1950, the proportion of such unreported cases identified only as existing at the time of their death has varied; it was as high as 14 percent in 1947. Experience shows that the proportion remains consistently higher in certain parts of the city.

Stage of Disease

During the eight-year period 1943 to 1950 inclusive, the annual number of new cases of pulmonary tuberculosis coming to the attention of the Health Department, including both those originally registered or those identified through death certificates, has ranged annually between 6,200 and 8,300. The stage of disease at the time of reporting is available for the great majority of cases (see p. 18). There is a rather striking similarity in the extent of involvement or stage of disease found in cases running through all these years. This is unexpected in view of the fact that most of the campaigns of the day, either through health education or mass X-rays, were directed mainly at securing an early diagnosis so that of course results of treatment would be more favorable.

In 1943 one-third, or 34 percent, of the reported pulmonary cases were said to be in the minimal stage. During the following eight years the proportion of these comparatively early cases rather than increasing has actually decreased until in 1950 the minimal cases comprised only 21 percent of the entire group.

Cases of moderately advanced pulmonary tuberculosis have hardly varied in their proportion of all cases during that time. In 1943, 37 percent of the cases reported were in the second stage; the only variation was in 1950 when their proportion rose to 43 percent.

Accordingly it is not surprising to find no very great improvement in the proportion of cases of pulmonary tuberculosis already found far-advanced at the time of their registration or reporting. Outside of the year 1943, when they made up 29 percent of the total, their proportion has varied only between 35 and 37 percent.

This constancy, of the distribution of the stages of disease among pulmonary cases, one of the authors of the present review (G.J.D.) has observed over a long period of years in his contact with tuberculosis work in this city. At the same time he also found a similar prevalence reported in imperial Germany among cases before World War I that were under the care or observation of various insurance groups at that time.

The belief that somewhat arbitrary special measures to discover cases of tuberculosis in an earlier stage should be successful runs counter to an important point, especially if we recall that in many instances, when active tuberculosis flares up, it is apt to develop progressively rather rapidly, more so than is usually thought of.

The inherent difficulty is that we are always facing the more or less natural evolution of the development of pulmonary tuberculosis. True, the course may be modified in exceptional cases by individual resistance or susceptibility; but in the main there is quite a normal course to this infection, as in many others, which social measures are not apt to modify easily.

The constancy in the development or spread of disease as manifested or visualized by a classification of cases according to their stage is also illustrated when one looks over tuberculosis hospital reports. For instance, in the available records of the Tuberculosis Sanatorium Conference of Metropolitan New York, which cover annually between 23,000 and 26,000 patients, it has been reported almost continuously over the years that the condition on admission as brought out by stage of disease has remained similar. For instance, in the year 1940, only ten percent of the cases admitted to these institutions were in the minimal stage and 55 percent far advanced. Nine years later the proportion of minimal was eleven percent and that of the far-advanced 50 percent.

It is true of course that these proportions as to stage of disease of patients hospitalized are different from those in the reports of cases when first registered with the health authorities. On the other hand, it is obvious likewise that it is those with active disease that are brought or sent to institutions for treatment. But it still remains a most serious matter however to realize that even nowadays -- when there are many social service organizations, expert clinic staffs, and consultation services for private physicians' cases all eager to assist in the placement of active cases -- to find that even then, on the first day of admission to the hospitals or sanatoria, one-half of all the patients are already far-advanced cases of pulmonary tuberculosis.

Tuberculosis in Different Racial Groups

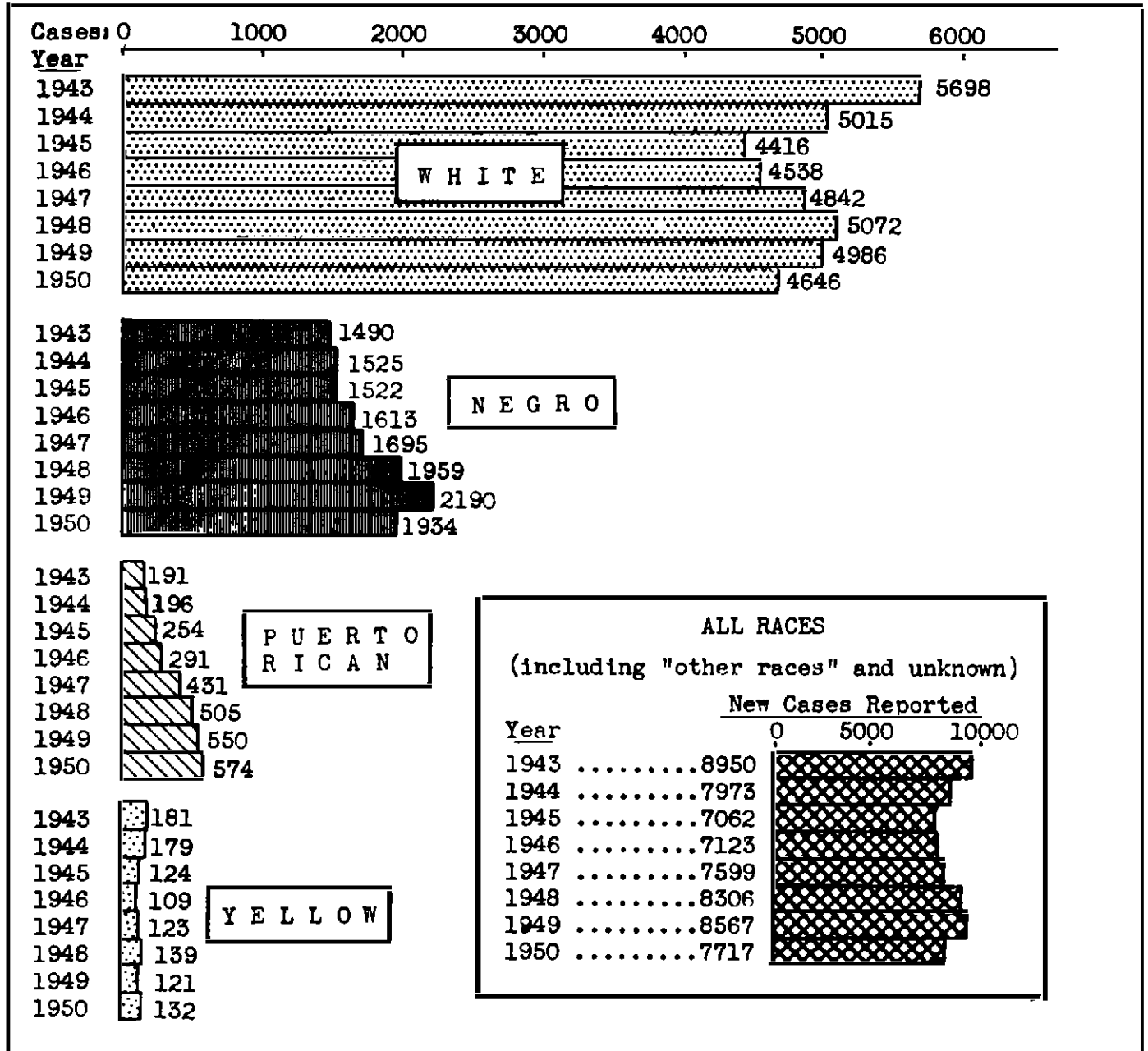
The problem of tuberculosis in New York City has always been complicated by the presence of large blocks of the population of different racial origins. Among these have been immigrant groups with different standards of living, limited economic resources, and as yet unaccustomed to the daily life and competition in this great center of population. Many in such groups came from rural areas rather than urban centers, and they always display at first a low degree of resistance to the conditions which favor the development of tuberculosis in such a congested center like New York City.

We shall refer again later to mortality rates, during the first half of the present century, among the foreign-born of different nationalities. But at the moment it is worthwhile, when we are considering the morbidity from tuberculosis rather than mortality records, to see what reports are available for certain racial groups now living in New York City (see Fig. 4).

With regard, first, to three large groups now in the community, namely, the whites, the Negroes and the Puerto Ricans who have been coming here in increasing numbers lately, and second, the small

Fig. 4

New Cases of Tuberculosis According to Race New York City, 1943-1950



Compiled from reports, Bureau of Records and Statistics, Department of Health, City of New York, by G.J. Drolet and A.M. Lowell, New York Tuberculosis and Health Association.

number of the Yellow race, there are interesting detailed records of the trend of tuberculosis among them during the eight-year period 1943-1950. May it be recalled for a moment that at the time of the Federal Census in 1950 the white population in New York City was said to number approximately 7,120,000; the Negro population, 748,000; and the "other colored", mostly Indians, Chinese, Japanese, 28,000.

In 1943 the number of new cases of tuberculosis reported in the white population was 5,698. In 1950, their number had declined by nearly one thousand, namely to 4,646, indicating at that time a registration rate of 65 per hundred thousand while the city average for all groups was 98.

Among Negroes 1,490 new cases of tuberculosis were reported in the year 1943, and in 1950 with their population larger they numbered 1,934. The report for the last year mentioned would indicate a prevalence or registration rate of new cases of tuberculosis of 259 per hundred thousand or slightly under four times that of the white population.

As previously stated there has been lately a very large and rapid immigration of Puerto Ricans into New York City. The special report of the Welfare and Health Council of New York City already mentioned estimated that in 1950 there were a quarter of a million persons here, born in Puerto Rico or of Puerto Rican parentage. The proportion listing themselves as Negroes is not necessarily high, around nine or ten percent; this however, does not take into account those with partial colored inheritance. A number are also of Indian stock. The reports of new cases of tuberculosis among Puerto Ricans have grown naturally with the increase of their numbers here. In 1943, for instance, 191 new cases of tuberculosis were registered among Puerto Ricans; in 1950, 574. This last number in relation to the population then classified as Puerto Ricans would indicate a tuberculosis registration rate for new cases of 233 per hundred thousand. This is a rate slightly under that for the exclusively Negro population; however, it is still three-and-a-half times that recorded for the white population.

Among those of the Yellow race, a more or less even number of new cases has been reported between the years 1943 and 1950, ranging between 123 in 1947 and 181 in 1943. In 1950, tuberculosis cases among people of the Yellow race numbered 132 and, in relation to the comparatively small part of the population they represented, this would indicate the extremely high rate of 473 per hundred thousand, or twice as high as for instance among Puerto Ricans. However, it is to be noted that this group includes an unusually high proportion of men in the period of life when tuberculosis is more prevalent. As a matter of fact, in 1950, of the 132 cases in members of the Yellow race, there were only 20 in the female sex and 112 were among men, mostly past the age of thirty.

These reports of tuberculosis in various groups in New York City illustrate one of the constant problems in the control of tuberculosis here, namely that, apart from the attention which has to be given to it among the permanent and long established part of the population, that which must be intensified to face the continued and large immigra-

tion coming here or passing through all the time. Years ago the tuberculosis problem was extreme particularly among immigrant groups such as the Irish, the Germans, the Italians and the Jews.

Immigration of this type, particularly of the first three groups, is now practically at an ebb; on the other hand there have now come here from other parts of the United States and its territories the very large numbers of Negroes and, lately, of Puerto Ricans. It is to be noted however with regard to this aspect that as the years go by, with the benefit of public health services and hospital facilities along with betterment of their social condition, in practically each of these groups it is but a short time before a marked lowering of the incidence of tuberculosis among them also occurs. The subject will again be referred to when we pass on from morbidity records to additional details in the mortality records of the past fifty years among different nationalities.

Sex Differences

Certain characteristics as to age and sex with regard to cases of tuberculosis among the various racial groups now present in New York City are worth noting, for they have an impact on preventive programs or facilities for the care of the victims of the disease among them. First of all, in the white population there is now a greater occurrence of tuberculosis in the male sex than in the female sex. In 1950, among the new cases reported, 3,212 were white males and 1,434 white females (see p. 21). Then again in the first group the age concentration, as far as numbers of cases are concerned, was greatest among men 45 to 55 years old. Among white women reported as suffering from tuberculosis the largest number was among those 35 to 45 years of age.

In the Negro population there was not such a disparity between the two sexes. For instance in 1950, among the new cases, there were 1,017 of the male sex and 917 of the female sex. The largest number of cases among men was among those 35 to 45 years of age, but among the Negro women, the concentration of cases was at an earlier age, namely, between the ages of 25 and 30.

Among cases of tuberculosis registered these days among Puerto Ricans, an entirely different ratio exists; there is an excessive amount of tuberculosis among Puerto Rican women. In 1950, of the total 574 new cases reported among Puerto Ricans, 244 were in the male sex, with the age concentration being in the very young group, 20 to 25 years of age (see p. 22). In the female sex where there were 330 new cases reported, which is almost fifty percent more than in the male sex, the concentration of cases was highest in the young group also of 20 to 25 years of age. Cases of tuberculosis in the Yellow race group of the population occur, as mentioned previously, mostly among men and they are spread fairly evenly in the age groups between 35 and 55 years of age. The few cases among the women of the Yellow race are generally in the younger age groups between 15 and 30.

* * *

"SPREAD OF TUBERCULOSIS"

IN a community like New York, covering such a large area and including a vast population, effective control of a serious communicable disease like tuberculosis demands definite knowledge as far as possible of its distribution and concentration among various groups of people and particularly in different neighborhoods.

For a closer appreciation of the trend, spread and distribution of tuberculosis during the fifty-year period 1900-1950, there have been available over the years segregated data classified along borough lines. But even these five divisions of New York City are in themselves too large to give precise knowledge of the local incidence of tuberculosis. The rates for each borough in great measure represent averages, some times theoretical midpoints between extremes of high or low rates of prevalence locally and therefore may lack reality, though for broad administrative plans they are still useful.

During the first quarter of the present century the Department of Health's vital statistics were classified and reported upon along local older political boundary lines that had fast become impractical. The shifts, spread, and increase of population nullified the possible comparative value of these rigid records. The divisions referred to were the old wards of the city: twenty-two of them, for instance, in the Borough of Manhattan, only two in the Bronx, thirty-two in Brooklyn, only five in the largest borough of the city, Queens, and five in Richmond. The disparity as to the populations involved in these wards is well illustrated, for example, by referring to the Federal enumeration of 1920: in the Twelfth Ward of Manhattan there were 951,904 residents. On the other hand, in the Second Ward there were only 372. Another ward, the Third, had 1,227 residents. Or again, the Nineteenth Ward had a total population at that time of 285,396. In Brooklyn almost as great non-comparable divisions existed; while the Twenty-sixth Ward had a population of 246,591 in 1920, the Second Ward had only 5,642.

Mention should be made however that in those years already there was being evolved by an independent group working with the Census authorities -- the population section of the Federation of Churches and subsequently the Cities Census Committee both of them guided by that remarkable pioneering spirit, the Reverend Dr. Walter Laidlaw -- a so-called census tract system for New York City based on a standard small unit generally of 40 acres in size against which population enumerations and other statistics could be classified. Outside of occasional minor studies along these new lines, and one very valuable analysis of the mortality returns of the sanitary areas in the Borough of Manhattan for the year 1915 by Guilfooy and Wynne (4), practically no use or connection of this important population background had been made with the Department of Health records.

In 1927 fortunately, representatives of the New York Tuberculosis and Health Association, the Department of Health, and the Welfare Council working together under a committee headed by Drolet, the statistician of the first-named organization, formally evolved

the important and now widely-used Health Area System of New York City(5).

In 1928 the Department of Health approved the plan for the classification of its vital statistics by Health Areas in New York City. Reports were published along these lines beginning in 1929 and they have had a very wide practical application since.

Health Center Movement

At this point it is important in the record of accomplishments of those days to refer to the District Health Center Plan(6) of New York City which is now playing so vital a part in bringing the facilities for public health service and protection on a neighborhood basis close to the homes of the people. An appreciation of the vital statistics during the last twenty years of the first half of the present century demands reference to the district health center movement.

In 1915 New York City's first District Health Center was established in the Lower East Side on an experimental basis to test the value of local administration of the functions of the Health Department and to develop a community spirit with respect to health conditions in that district. It was the first independent step based upon the fact that the work of the Department of Health and of private agencies could be so coordinated that efficiency would be improved and the volume and quality of service be increased. The area which it covered had about 30,000 local residents. The system was also tried in a limited way in the Borough of Queens; these first steps were not developed further at the time.

In 1921, following World War I and the keener realization of cooperation among all citizen groups and authorities, the New York Chapter of the American Red Cross opened the East Harlem Health Center. There, the Department of Health and a group of twenty-one voluntary agencies joined hands in facing the many health problems in that section of Manhattan. A great deal of practical experience in the coordination of public and private agencies and the rendering of service on a larger neighborhood basis was obtained which had a profound influence upon the health movement in succeeding years. Subsequently, the East Harlem Health Center was brought into the municipal group of these local institutions.

Then in 1926, with the support of the Milbank Memorial Fund, the Bellevue-Yorkville Health Demonstration was formally inaugurated in the area extending from East 14th to East 64th Street which included some 200,000 people. The remarkable achievements of that undertaking in public health and social service have been interestingly described by Winslow and Zimand(7). Thereafter there was no more questioning of the value and practicability of public health service on a neighborhood basis.

It is worthwhile digressing for a moment to refer to the practical part played by the organization of the vital statistics

records of New York in the development of plans for health center districts all over the city. Under the aegis of the Committee on Neighborhood Health Development, Drolet and Potter(8) prepared a formal report in 1930 entitled "Proposed Health Districts, New York City" -- wherein aggregating a certain number of health areas into definite neighborhoods, they led to the adoption of an official division of the City of New York into thirty health center districts. The constructive use of the new data becoming available in those days was reported upon by Drolet and Weiner(9) at the meeting in 1931 of the American Public Health Association in Montreal.

In 1930, in rented quarters, a Department of Health Center was opened in Central Harlem to serve a population of nearly 200,000, predominantly Negro. The economic depression of these days delayed for a while the erection of new District Health Centers. However, the plans for the organization of the work of the Department of Health on this basis developed apace and in 1934 the Department formally decentralized its services and reorganized them under a neighborhood district plan.

Local Trend of Tuberculosis, 1930-1950

Between 1930 and 1950 the annual number of new cases of tuberculosis reported in New York City was, as previously mentioned, materially reduced, namely from 12,506 during the first year quoted to 7,717 during the last year, a decline of 38 per cent (see p. 14). In Manhattan the reduction in new cases was at a slightly lesser rate, their number falling from 5,847 to 3,847, or by 34 per cent. In the Bronx the reduction was greater, namely by 43 per cent; and, in Brooklyn it was still more, the number being almost cut in half, from 3,546 to 1,948 or by 45 per cent. In the Borough of Queens the reduction in the number of new cases was least, 32 per cent, not necessarily because of a higher incidence of tuberculosis but owing to the extreme increase of population.

Within the various parts of the city, the change as to the local incidence of tuberculosis has naturally varied. In Central Harlem the number of new cases during that twenty-year period of 1930-1950 fell from some 1,100 to 800, or by 29 per cent, as against a city average reduction of 38 per cent. On the Lower East Side the rate of decline was still less, 21 per cent.

In the Bronx there has been a rather marked deterioration of the dwelling sections in Mott Haven and Morrisania, which, along with overcrowding, has materially reduced the rate of progress there against tuberculosis. As against an average decline of 44 per cent in that borough, in Mott Haven the number of new cases reported during the past twenty years has fallen by only 14 per cent; in Morrisania by 25 per cent.

In Brooklyn the tuberculosis problem in the Bedford Section has remained almost as great as it was years ago. The number of new cases reported there between 1930 and 1950 came down by 5 per cent only. In the Fort Greene area of that borough the reduction in cases likewise has not been at as great a rate either as in the remainder of Brooklyn.

Districts just mentioned -- Central Harlem, in Manhattan; Morrisania and Mott Haven, in the Bronx; Bedford and Fort Greene, in Brooklyn -- have become predominantly Negro or Puerto Rican areas. Care must be taken in the reading of the reports of new cases to bear in mind that they refer to their absolute number and not to the rate with due regard to changes or increase of population.

It is therefore worthwhile to quote now a few figures with regard to the registration rates for new cases (see p. 15). Between 1930 and 1950, the rate for New York City as a whole changed from 180 per hundred thousand population to 98. During the first year of the period mentioned, against an average rate for the city of 180, that of Queens was 116, of the Bronx 132, of Brooklyn 138 and of Manhattan 313.

In 1950 there was still a wide variation in the tuberculosis registration rates in the various districts of the city. As against an average for the city of 98 per hundred thousand population for new cases reported during the year, a low rate of 45 prevailed in the Flushing section of Queens. In Brooklyn the lowest rate was in Flatbush, 35, and the highest in Fort Greene, 130. In the Bronx there were differences all the way from the rate of 34 in the Westchester District to a rate of 125 in Mott Haven. In Manhattan, in six of the health center districts of that borough the rate exceeded 100. It was 79 per hundred thousand population for new cases alone in Kips Bay-Yorkville, in upper midtown; 263 in the Lower East Side; 276 in the Lower West Side; and, 364 in Central Harlem, a rate more than ten times the rate in the Flatbush area of Brooklyn.

Reference has been made previously to the registration rates in the two important racial groups of the City of New York, the white and non-whites, with regard to the reporting of new cases only. The real prevalence of tuberculosis however is not to be fully appreciated unless we look in various years at the register of both the old and the new cases. For instance, on the last day of 1930 there were in the tuberculosis register of New York City a total of 18,866 cases of pulmonary tuberculosis, and on the same day of 1950 there were still 17,985. The last two figures are urgent reminders that, though the case fatality rate of tuberculosis has been reduced because of improvements in the treatment of the disease, as far as the volume of cases of tuberculosis requiring care is concerned it is almost as great in size as it was some twenty years ago.

On the last day of 1950, considering cases of all forms of tuberculosis, pulmonary and non-pulmonary, the Department of Health records contained the names of 19,059 persons, residents of New York City. Of these 7,411 were of the female sex and 11,648 of the male sex. On the basis of race, 12,472 were whites, and 5,725 were non-whites. Among the colored the cases of tuberculosis in each sex were not materially different in number. However, in the white population 4,396 of the tuberculosis cases were of the female sex as compared with 8,076 being of the male sex.

Present Prevalence of Tuberculosis in New York City

It is customary nowadays when referring to the results of case findings in mass surveys of the apparently healthy population to speak of the number found per each one thousand persons X-rayed. More recently the average number so found has been around one or two cases of tuberculosis for each 1,000 persons. Similarly it is worth studying the present prevalence of known cases of tuberculosis in New York City. The 19,059 cases of tuberculosis on the Department of Health register on December 31, 1950, would indicate in relation to the population a prevalence rate of 2.41 for each 1,000 persons. Wide differences of this rate are found in different sections of the city. First must be noted in the Gravesend District of Brooklyn, with a population of nearly 300,000 people, that the 256 known cases there represent a prevalence rate of 0.91 or slightly less than one per thousand. This is the lowest rate in any section of New York City. In the same borough of Brooklyn, there is a rate in the Bedford District of 2.4 per thousand population, a similar rate in Williamsburg-Greenpoint and, finally, one of three per thousand persons in the Red Hook-Gowanus District.

In Queens, the range in the prevalence rate for all known cases on a given day is from 1.37 in the Flushing area to 2.01 in the Astoria-Long Island City section, the borough averaging 1.67. Among residents on Staten Island the prevalence rate is 1.49. In the Bronx the borough has an average prevalence rate of 1.82, the lowest being in the Westchester District, 1.13, and the highest being three times as high or 3.01 in the Mott Haven area. It is 2.52 in Morrisania.

In Manhattan the figures again indicate a very high prevalence rate of tuberculosis. First, there is the high average for the borough as a whole of 4.35 per thousand population. The rate is lowest in the Riverside District, west of Central Park, where the prevalence rate is 2.18, followed by a rate of 2.26 in Kips Bay-Yorkville and of 2.3 in Washington Heights, of 4.96 in East Harlem -- in other words, twice the average -- and finally a rate of 9.71 in Central Harlem. The latter is ten times the rate in the Gravesend District and indicates a known prevalence of tuberculosis in one percent of the entire population of Harlem.

Tuberculosis Morbidity Rates

In dealing with statistical aspects of known cases of tuberculosis there are a variety of indices that need clarification or restatement to understand their limitation or their significance. The most common figure deals with only the new cases reported during the year. The second and more practical index is the one which considers at least the total known problem on a given date, generally the last day of the year. But even then we have not before us the total tuberculosis problem as known during an entire twelve-month or one-year period. To illustrate the last mentioned point and its weight, it is worthwhile referring for a moment --

where the records are available -- to all additions and removals for a given year as well as to those cases already under supervision at the beginning of the year. For instance, in 1908, the Department of Health records permit such a presentation at least for the known cases at that time. First, at the beginning of the year, namely on January first, the Department of Health roster already included or had knowledge of 33,421 cases of pulmonary tuberculosis. That year in addition, 23,325 new cases were reported so that in reality there were known to the authorities for just a twelve-month period no less than 56,746 cases of pulmonary tuberculosis in New York City (see p.23). This grand total of all known cases during certain years has varied from the 56,746 just mentioned in 1908 to 45,548 in 1920, 37,787 in 1930, 29,849 in 1940, and to still 30,017 taking tuberculosis cases of all forms for the year 1950. Even though during the ten-year period 1940 to 1950 the mortality rate has declined materially, it is surprising to find the maintenance of a practically level number of known cases during those years.

Type of Care

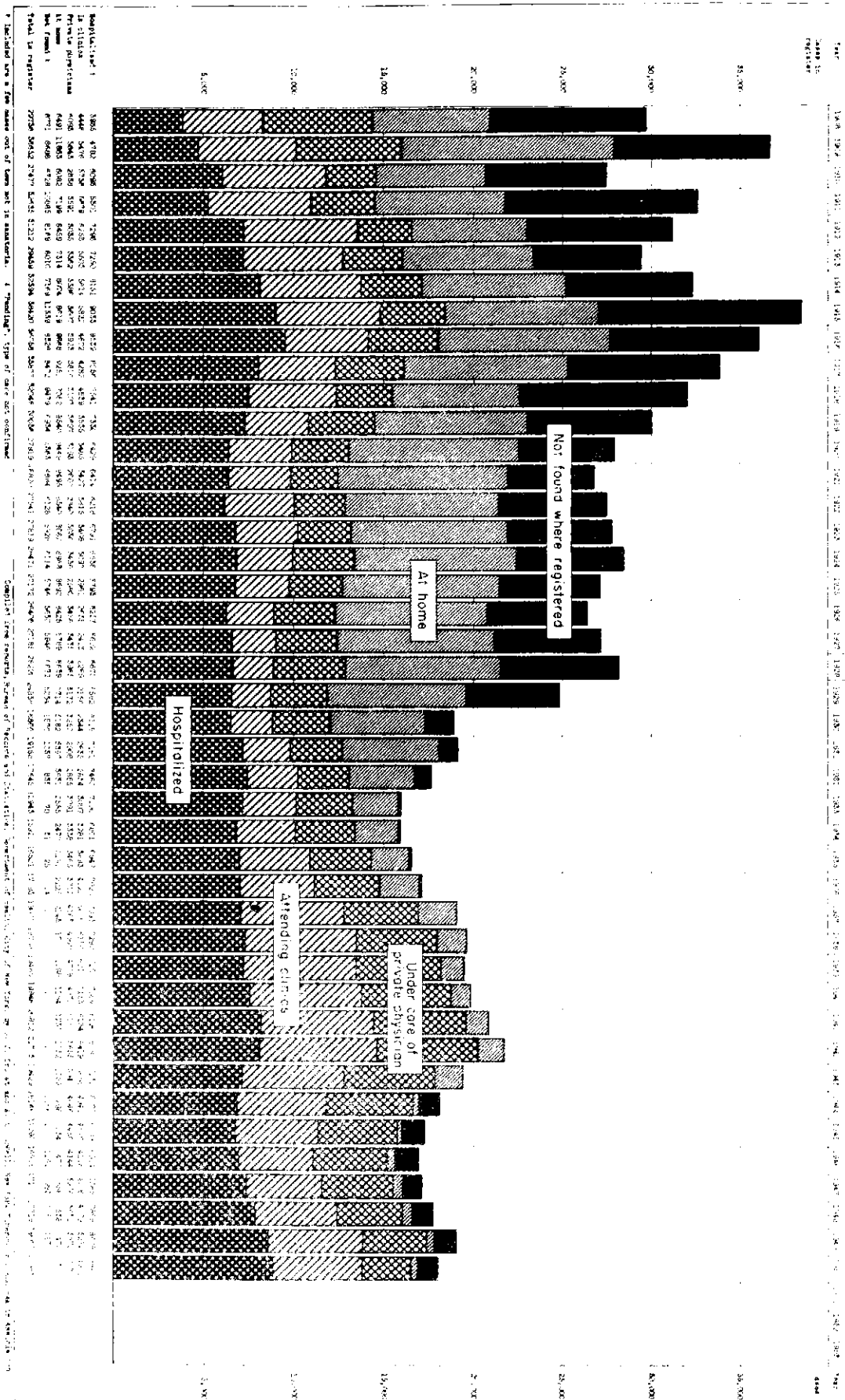
New York City being the original home of the registration of tuberculosis has a continuous record that provides an interesting opportunity to see how over the years, generally speaking, the tuberculosis cases have been cared for -- at least as to the type of institution where they were treated or whether they went to clinics or private physicians. The classified register is best available for these details during the forty years from 1910 to 1950 (see p.27). In the first year just mentioned, on December 31, there was a total of 27,477 cases of pulmonary tuberculosis. Of these twenty-seven thousand cases, only 2,838 or ten percent, were reported as being under the care of private physicians. The largest number, 5,736, were attending tuberculosis clinics; this group included twenty-one percent of the known cases (see Fig. 5).

In institutions, namely hospitals within the city, there were said to be, on the last day of 1910, 3,648 tuberculosis cases. At that time there were already quite a number of patients in country sanatoria or in out-of-town health resorts, namely 2,445; they comprised about nine percent of the entire group of known cases. Remaining at home, not attending at the time either a clinic or going to a private physician, were no less than 6,082 cases. They were of course under a certain degree of supervision by the Department of Health though it was the very first year when the worthwhile calls of public health nurses became possible. Finally, 6,728 cases had been lost track of or rather had probably moved and could not be located at the address where they had been registered at first.

Over the years the number of tuberculosis patients under the care of private physicians has ranged from the low number of 2,600 at the end of 1921 to a total of 5,655 at the end of 1942. The group of cases of pulmonary tuberculosis under the care of private physicians has again dwindled down in recent years to 2,770 in 1950.

TYPE OF CARE, PULMONARY TUBERCULOSIS CASES IN NEW YORK CITY ON DECEMBER 31ST OF EACH YEAR SINCE 1908

Fig. 5



† Included are a few cases not in statistics. † "Hospitalized" type of care not included. Complete time records, Bureau of Records and Statistics, Department of Health, City of New York, for 1908 to 1934. See also A. J. Campbell, New York, 1934, p. 100.

Throughout the years the tuberculosis clinics in the various districts of New York City have played an important part in keeping under their care or observation a large number of tuberculosis cases. Of course, frequently after they had been diagnosed as having active tuberculosis, the patients were referred to institutions for treatment but again after their discharge they returned for follow-up to these same neighborhood clinics. On the last day of the year 1910, there was a total of 5,736 cases of pulmonary tuberculosis under the care or observation of the tuberculosis clinics. The number attending these clinics has varied materially at times; at the end of 1929 -- "times" were still good that year-- it was as low as 2,136. On the other hand the number again became large, especially between 1937 and 1942; in that last year it rose to 6,419. By 1950 there were still almost some 5,000 tuberculosis cases under the care or observation of the clinics.

Now as to the all-important group of patients hospitalized; their number has varied of course with the facilities available. In 1910, at the end of the last day of that year, there were said to be 3,648 patients in institutions within the city; another 2,445 in sanatoria or in health resorts. The number of patients hospitalized within the city alone reached a peak first in 1916 when they numbered 6,651. Sea View Hospital had been opened in 1913 and it met a very great need. The numbers hospitalized dwindled down to a low of 3,041 in 1922, and then started to rise again. The increase in hospitalization between 1940 and 1950 has been rather important and must be acknowledged to have played a material part in the corresponding decline in new cases during this period.

The number of patients out of town in sanatoria -- mostly private institutions originally has not varied materially throughout the years, ranging between 2,000 and 3,000 at the most. It has tended if anything to decrease slightly lately now that the "means test" in public institutions has been abolished. On the other hand a limited number of cases, residents of New York City, are now being cared for in upstate public institutions.

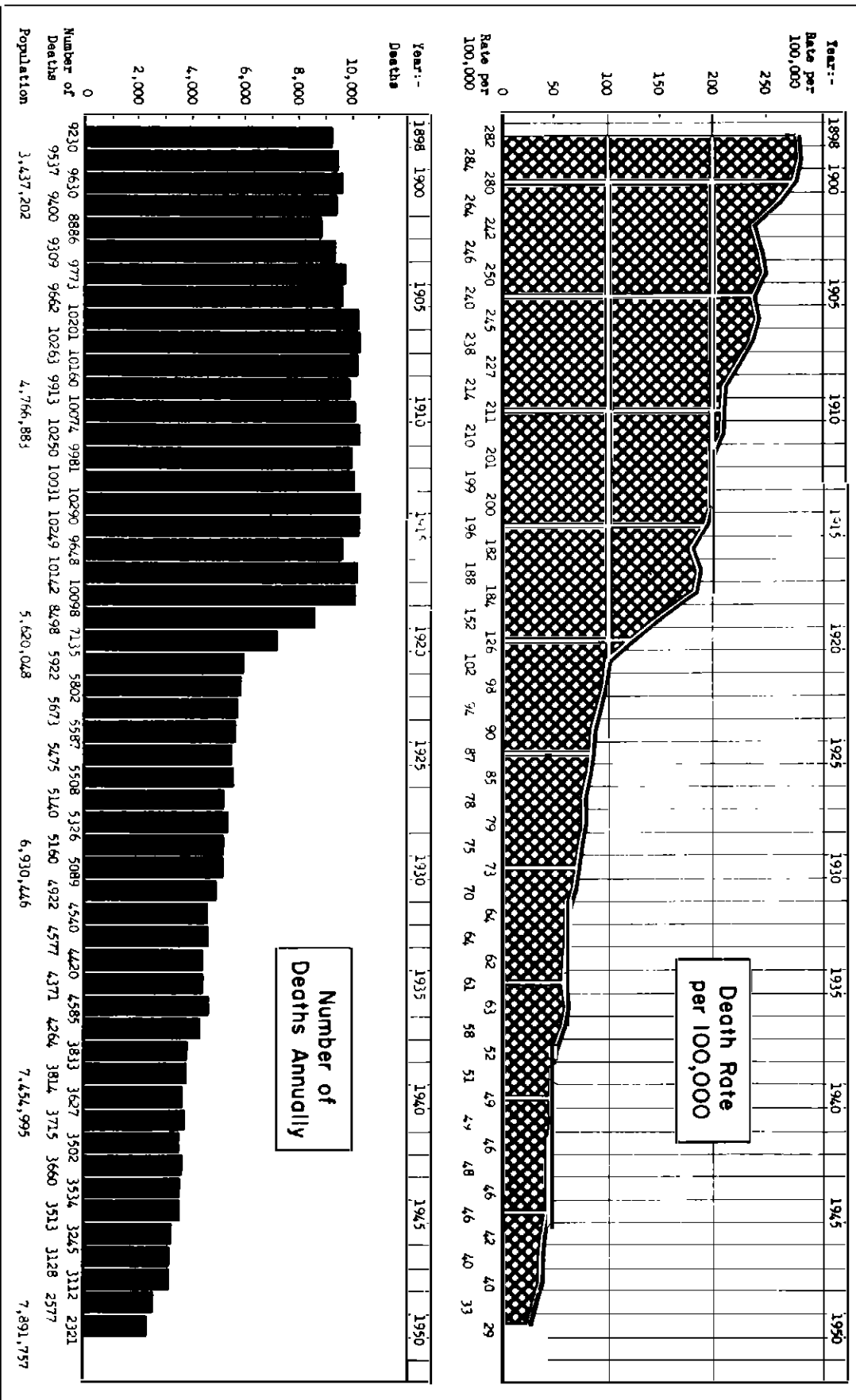
As noted, a large part of the tuberculosis roster formerly consisted of "at home" cases -- patients not attending clinics or who had failed to return to their doctor for some time. From numbering 6,082 in 1910 the "at home" cases rose to 9,495 in 1921. Nowadays, fortunately, that number of delinquents has been practically wiped out. Similarly there is not the same material number in the register of so-called not found cases.

The changes in the classified register just described shed light on a unique picture of the ebb and flow of the tuberculous members of a great city.

* * *

Fig. 6

TUBERCULOSIS, NEW YORK CITY - SINCE 1898



Compiled from reports, Bureau of Records and Statistics, Department of Health, City of New York, by G. J. Drolet and A. W. Lowell, New York Tuberculosis and Health Association.

TUBERCULOSIS MORTALITY, NEW YORK CITY

OVER the years and in different places records of mortality from tuberculosis have remained the more definite comparable index of the ravages of the disease. Registration of new cases is apt to be more incomplete and for that matter it is more difficult in the early stage to say whether a case is truly one of active disease or not. Then too the general requirement of filing reports of all deaths assures a higher degree of reporting; finally tuberculosis in its terminal stage particularly the pulmonary form is a matter of common knowledge. It is therefore of importance to study more closely the various aspects of the tuberculosis mortality in New York City during the first half of the present century.

During the fifty years between 1900 and the end of 1949, there were recorded in New York City almost three hundred thousand deaths from pulmonary tuberculosis (290,267). At the same time nearly forty-one thousand other deaths (40,947) were reported as due to the non-pulmonary forms, such as tuberculous meningitis, military tuberculosis, and other tuberculous conditions more common among children (see p. 38). The total number of these premature deaths (331,214) caused by tuberculosis is greater, for instance, than the entire present population of cities like Rochester, New York, or of Atlanta, Georgia.

During the twenty years beginning in 1900 the non-pulmonary type of deaths from tuberculosis was proportionately greater than at present; opportunities for infection from bovine sources were widespread at that time. It was only towards the end of the second decade of the present century that control measures against this source of infection came into effect. Of the 97,197 deaths from all forms of tuberculosis, from 1900 to 1909 inclusive, 13 percent were due to the non-pulmonary forms. Again, between 1910 and 1920, when tuberculosis deaths totalled 99,261, those of the non-pulmonary type numbered 13,434 representing therefore nearly 14 percent of the total. The proportion of this type of mortality gradually came down until it was reduced to 8 percent during the decade of 1940 to 1949.

As against almost one hundred thousand deaths from tuberculosis being recorded during each of the first two decades of the present century, during the ten years from 1940 to 1949 the number fell to 33,613, or by two-thirds.

Declining Death Rate

The tuberculosis death rate declined continuously during the first half of the present century. Whereas in 1900 it was still 280 per hundred thousand population; in 1910 it was 211; in 1920, 126; in 1930, 73; in 1940, 49; and by 1950 it was down to 29, a decline during that period of 90 percent. Progress was not at an equal rate during the several decades. During the first decade,

from 1900 to 1910, the rate declined by only 25 percent; between 1910 and 1920, there was a greater drop, 40 percent. It will be remembered that during that period occurred the most serious influenza epidemic which took thousands of lives in New York City. For some still unexplained reason it seems to have wiped out somehow a reservoir of infection or of cases for within two or three years thereafter the death rate from tuberculosis came down precipitously, in a manner which has not been repeated since.

Between 1920 and 1930, the tuberculosis death rate dropped from 126 to 73, namely by 53 points or by 42 percent. The decade which followed included, it will be recalled, during the early 30's, a serious economic depression resulting in wide unemployment and want. While it ultimately led to the widespread development of public relief, still its effects were felt broadly and the tuberculosis death rate declined during that decade at a lesser rate, namely by 33 percent. Between 1940 and 1950 the rate of decline, as is well known, was accelerated by the developments in specific therapy and a further drop of 41 percent took place, most of it after the year 1947 when streptomycin came into use.

It is rather striking when looking closely at the annual number of deaths, for instance between 1900 and 1918 inclusive, to see the constancy despite the obvious growth of population during those years in the number of victims each year; in 1900 there was a total of 9,630 deaths from tuberculosis; in 1908, 10,160; and in 1918, 10,098; the small increase noted between the first and last year being hardly commensurate with the growth of the city. It almost seems to suggest that there were certain groups of the population or certain types of habitations wherefrom there arose each year an almost identical number of tuberculosis cases and of deaths (see Fig. 6).

Then after the visitation of the influenza epidemic in 1918 there was the sheer drop in the tuberculosis mortality which took place almost immediately. For instance, the deaths in 1921 were already under six thousand, whereas only three years previously they had numbered over ten thousand. In the succeeding years the mortality declined rather slowly, not levelling down to 5,000 or less until 1930; then it hovered around four thousand until 1937. Up to 1948, tuberculosis deaths in New York City still numbered three thousand or more, but in 1949 and 1950 they came down sharply to twenty-five hundred and to 2,321 in the last year mentioned.

Differences in the Mortality of Each Sex

During the fifty years under consideration a sharp difference arose between the two sexes as regards their tuberculosis mortality. In 1900, for instance, when the deaths totaled 9,630, those in the male sex, 5,783, comprised 60 percent of the total mortality, the 3,847 in the female sex being the remaining 40 percent. In 1910 the proportion of the mortality of the male sex had already risen to 63 percent. It stayed around that level until 1940 when the deaths

in the male group were responsible for 66 percent of the total mortality. Finally, in 1950, almost three-fourths, namely 74 percent, of the mortality was suffered by the male sex while only 28 percent occurred in the female sex.

If one relates these numbers to the group of the population exposed we first find that in 1900, when the city rate averaged 280 per hundred thousand population, the tuberculosis mortality rate of the male sex was 338 and that of the female sex 222. At that time the ratio of the mortality of the male sex to that of the female was therefore 1.5 to 1.0. By 1950 the death rate in the male sex had fallen to 45 per hundred thousand population and that in the female sex was down to 15, or only one-third of that of the male sex.

Non-pulmonary Forms of Tuberculosis

Mention has previously been made that formerly the non-pulmonary forms of tuberculosis were far more prevalent than nowadays. From a rate of 43 in 1900 it was reduced to 29 in 1910 and to only 2 by 1950, a mere fraction of what it was previously. As is well known, it is children who have benefited most from this practical eradication of active tuberculosis among them, the principal factors being, first, the increasing isolation of open cases of tuberculosis in hospitals; second, the development of steps for the control and eradication of bovine tuberculosis, including the general pasteurization of milk. These measures had a most marked and almost immediate effect on the situation.

As against 1,476 deaths from the non-pulmonary form of tuberculosis at all ages in 1900, there were only 167 in 1950. In 1900, 875 deaths from tuberculous meningitis were reported, whereas in 1950 there were only 67. For many years deaths from tuberculosis of the intestinal tract or of the peritoneum ranged between 100 and 200 annually, but by 1950 there were only 6 such deaths (see subsequent section, p. Lxxi, Tuberculosis among Children).

"Consumption" in the 1880's

A rather remarkable record of health conditions in New York City and in Brooklyn in the late 1880's is to be found in a special report by Dr. John S. Billings(10) of the United States Army, an expert special agent of the Census Office at that time. (See Fig.7).

Billings made a detailed study of the population, of general living conditions and of the vital statistics of different parts of both New York -- then including the Boroughs of Manhattan and the Bronx -- and of Brooklyn, which at that time was not yet incorporated into the Greater City of New York. Some of the data relate to mortality from "consumption" in those days. He remarks that during the six-year period ending June 1, 1890, the death rate from consumption, namely, pulmonary tuberculosis, in New York City averaged

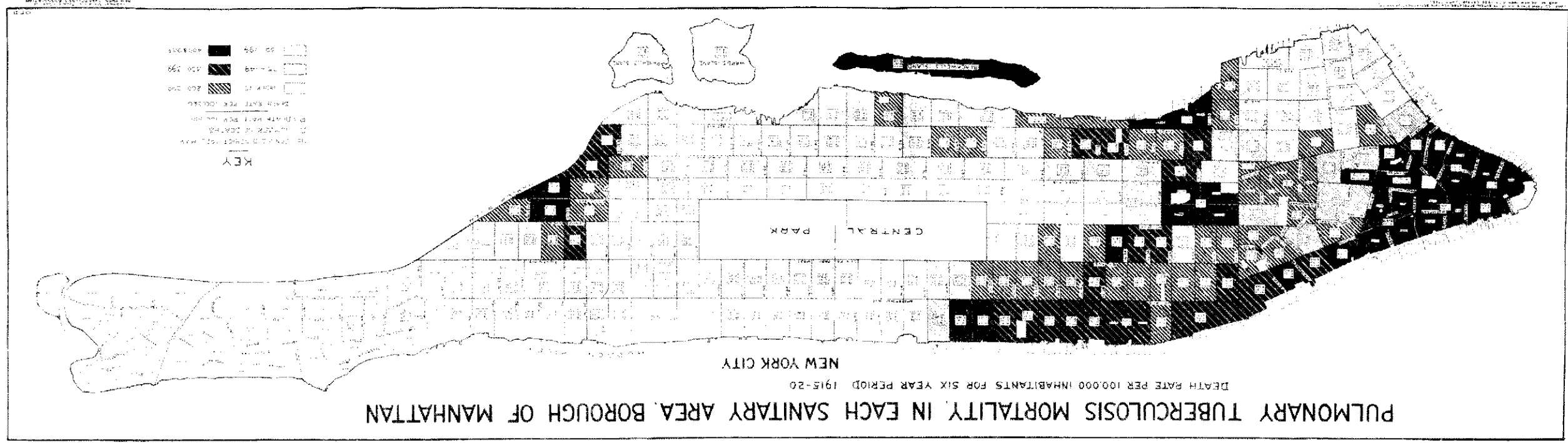


Fig. 8

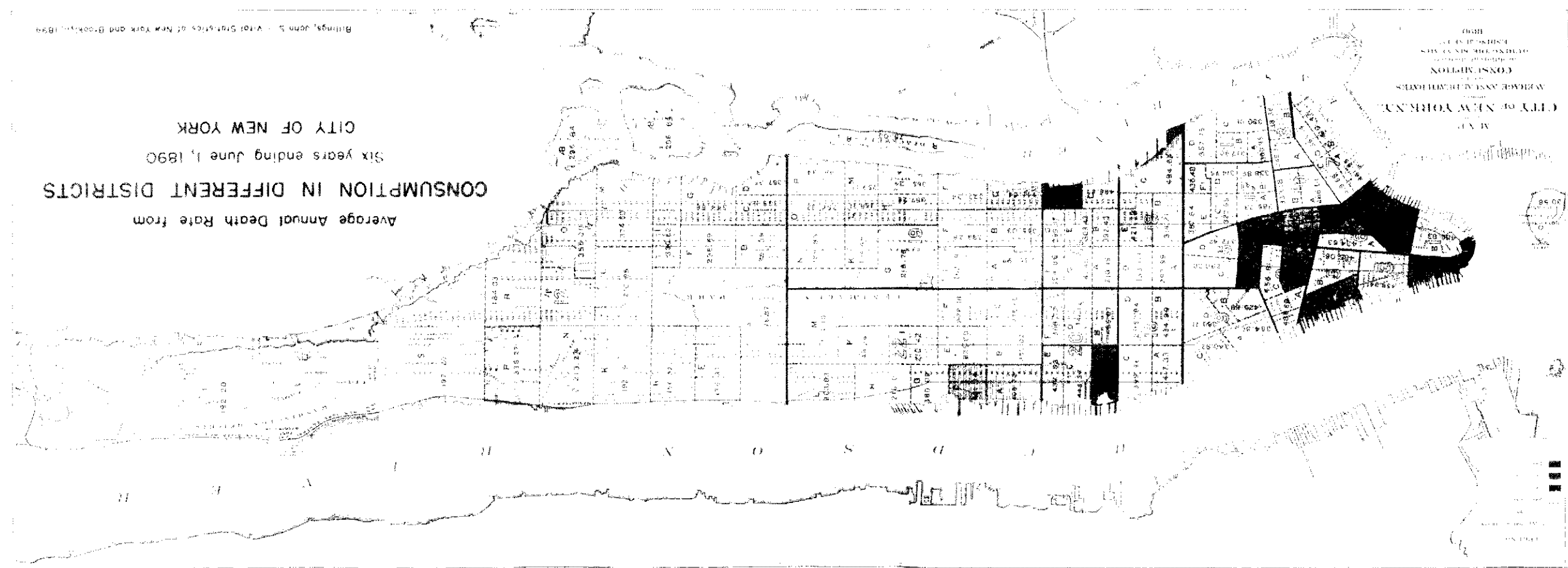


Fig. 7

392 per hundred thousand population. In Brooklyn it was much lower, but still high as compared with standards of today; the rate was 303. In different Sanitary Districts, as Billings then called certain sections, he found very great differences and sometimes unusually high rates. In the Second Ward of New York, in downtown Manhattan, slightly above Maiden Lane, there prevailed during those years a mortality rate from consumption of no less than 776 per hundred population. Billings remarks that people residing there suffered the highest mortality rates for most of all the common causes of death.

On the other hand, during the same years of 1884 to 1890, in the upper section of the West Side of New York City in Sanitary District K of Ward Twenty-two, located between West 68th and West 77th Street, the death rate, even at that time for consumption, was only 49 per hundred thousand population, or only one-fourteenth of that in Ward Two. Billings adds that the West Side area was "a beautiful residential section".

In Brooklyn, though the rate for that city as a whole was less than that of New York, still there was one section around Newtown Creek in Greenpoint where the pulmonary tuberculosis death rate during the six years under consideration had been no less than 1,046 per hundred thousand population. The lowest rate in Brooklyn, namely 96, was toward the Evergreen Section. Billings describes that area as one of "a suburban character, residential, with small individual dwellings".

Tuberculosis in the 1900's

To understand better the changes in the prevalence of tuberculosis during the first half of the present century, it is worthwhile establishing a more definite picture of conditions during the earlier years. We are told in the extremely interesting first annual report (11) of the newly organized Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York, now the New York Tuberculosis and Health Association, that in 1901 there were quite varied death rates from consumption in the different wards especially of Manhattan. In the section of the report on the Social Aspects of Tuberculosis by Miss Lillian Brandt, then the statistician of the Committee, we are reminded that, whereas in 1901 the death rate from consumption in Manhattan and Bronx averaged 250 per hundred thousand population, only eleven years previously, namely in 1890, the rate was 341 (see Fig. 9).

In other words during that period the rate had come down by 91 points, or by more than 26 percent. Referring to this again the writer in the same report expresses her satisfaction in this manner: "Since 1890 there has been a decided improvement in the general sanitary condition of the city: the streets now are actually cleaned; several small parks have been introduced in the most crowded districts, displacing some of the worst tenement blocks;

recreation piers have been built; the milk supply has been brought under supervision; medical inspection has been established in the public schools; a corps of physicians under the direction of the Board of Health visits the tenements systematically every summer... Besides the municipal activities there has been an enormous development of private organizations which concern themselves, directly or indirectly, with the health of the poor..."

But a close study of the detailed reports given for different sections of the Borough at that time reveal that in parts of the city conditions were not all too favorable. First, recalling that the tuberculosis death rate from consumption averaged 250 per hundred thousand, the same report gives the rate for each of the twenty-two wards into which the central borough was then divided. Of these wards ten had tuberculosis death rates of 300 or more per hundred thousand population. Manhattan at that time had 1,850,093 inhabitants. In the Fourth Ward were residing some 19,000 people; the consumption death rate there in 1901 was no less than 506 per hundred thousand. The Fourth Ward was located between the East River and Park Row about Chambers Street; this district, originally marsh-land, was still known as "The Swamp". It is said that sailors' boarding houses were quite numerous.

Even worse was the death rate from consumption in the Sixth Ward, 518 per hundred thousand. This was the section between Park Row and Broadway, Canal and Centre Streets. In that area were large manufacturing and business houses with tenements mixed in. The city prison, "The Tombs", was located there.

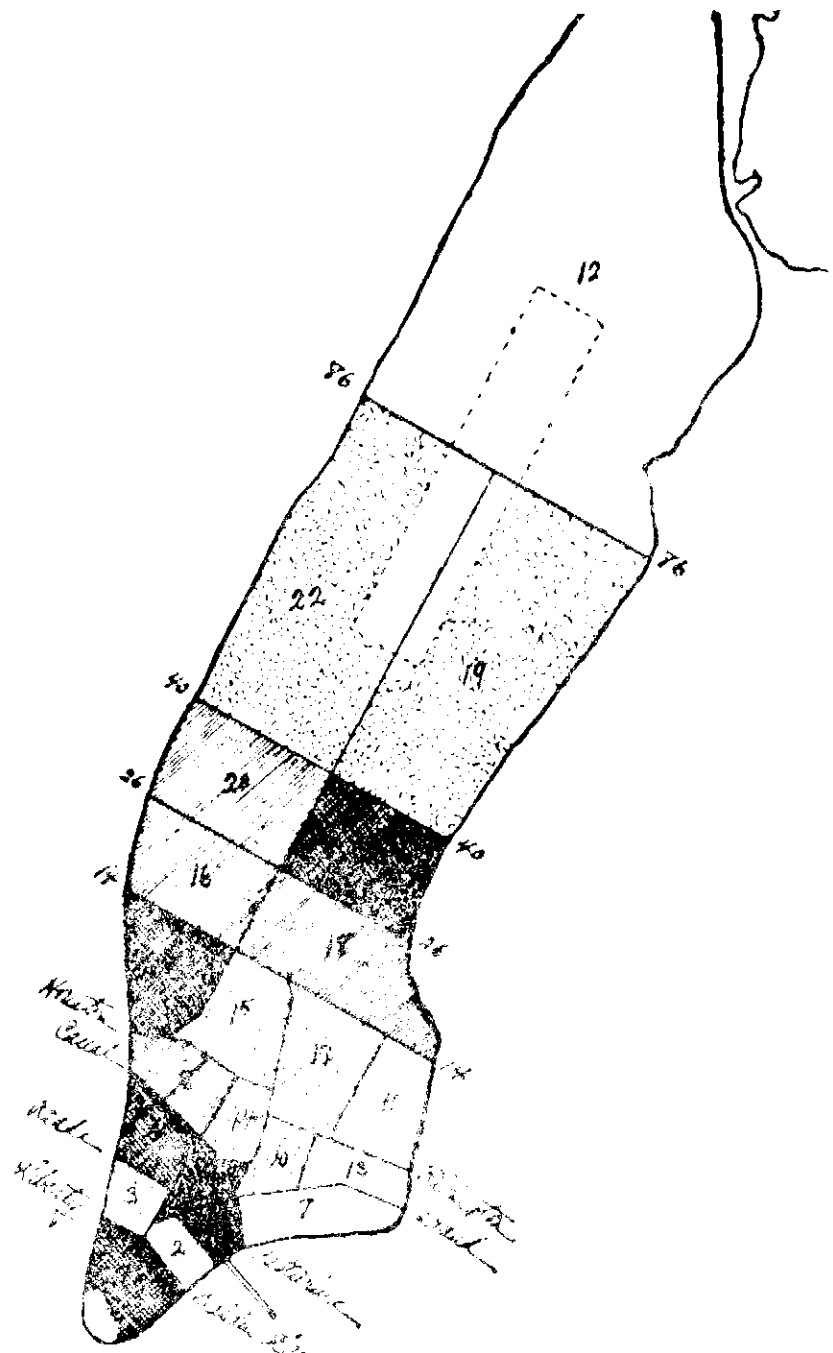
The lowest consumption death rate in 1901 in Manhattan was in the Thirteenth Ward, the area between Rivington and Grand Streets, from the East River to Division, the rate being 102 per hundred thousand people. Of that district, it is remarked, "it was well elevated and the houses built on good land. There was a large German population residing in that area."

In the report, previously mentioned, by Miss Brandt, some satisfaction seems to have been expressed also with regard to conditions in the Tenth Ward. And yet the consumption death rate at that time was 201 per hundred thousand. She remarks: "It is the large Hebrew element in the Tenth Ward which gives this notoriously congested spot a comparatively low rate of tuberculosis."

Pulmonary Tuberculosis, Manhattan 1915-1920

In 1922 Drolet (12), unaware at the time of the map showing the incidence of consumption in different districts of Manhattan in the 1880's previously prepared by Billings, published an almost identical presentation of the pulmonary tuberculosis mortality in each sanitary area of the Borough of Manhattan, also for a six-year period, but this time from 1915 to 1920 inclusive (see Fig. 8). The rates prevailing in the 1910's were, of course, much lower than those in the 1880's.

Fig. 9



2. Birth rate per 1000 living, 1901.

[White box]	Less than 20 per 1000 living
[Horizontal lines box]	20 - 29 - 15000
[Vertical lines box]	30 - 39 - 10000
[Diagonal lines box]	40 - 49 - 10500
[Solid black box]	50 - 59 - 10000

Manhattan by Wards

During the six-year period 1915-20, the death rate from pulmonary tuberculosis in New York City averaged 148 per 100,000 population. In the more recent Manhattan map, just mentioned, the tuberculosis rates were shown separately for almost 300 different sub-divisions of that borough. It is rather striking, when looking at both the Drolet and Billings maps, to notice much similarity, namely, some of the very highest tuberculosis death rates in the extreme lower sections of Manhattan, then a comparatively low prevalence in part of the East Side, again high rates in what might be called the Bellevue Mid-town section, likewise on the edge of the Lower West Side sections. However, for the first time, in the more recent map, appear new areas of high mortality rates mostly in East Harlem but spearing into Central Harlem itself.

Even during the recent six-year period just mentioned some thirty sanitary districts of Manhattan had death rates from pulmonary tuberculosis exceeding 400 per each 100,000 inhabitants. Areas of high tuberculosis rates were found along all of the Lower West Side and in every district south of Canal and Catherine Streets; in Harlem, north of 126th Street and east of Eighth Avenue towards the Harlem River; then in the central East Side between Fourteenth and Forty-fourth Streets. Some of the sections just mentioned were referred to at the time as the colored section in the "San Juan Hill" of the West 50's, the poor and rough district of "Hell's Kitchen", that of the longshoremen along the lower North River, also the very dense and poor district of "Little Italy" around Mulberry Bend and Chinatown.

On the other hand, comparatively low death rates from pulmonary tuberculosis were found in the Lower East Side, east of the Bowery and below Fourteenth Street, the district being mainly inhabited by a Jewish population. In the Lower East Side sanitary areas bounded by Avenues B and D and East Third and Ninth Streets, which is included in the East Side section just referred to, the death rate was only 69 or less than half of that of the city at the same time -- although it is also added that the last Federal Census had indicated a density of 650 people per acre in this district.

The lowest tuberculosis mortality during the 1915-1920 period occurred in the district alongside Central Park, between East 63rd and 70th Streets and Fifth and Park Avenues. There, the rate was only 21 per 100,000 or but one-seventh that prevailing in the entire city.

The same study indicated that in two districts located downtown in the old sections around Mulberry Park, or in the very old houses still utilized below Liberty Street, tuberculosis was taking victims at a rate fifty times as great as in the Fifth Avenue district. Six persons out of every one hundred living there died from pulmonary tuberculosis between 1915 and 1920.

All along Riverside Drive, north of West 70th Street, a low tuberculosis mortality prevailed, some districts having as low a rate as 32 per 100,000.

* * *

TUBERCULOSIS MORTALITY IN DIFFERENT NEIGHBORHOODS
DURING LAST TWENTY YEARS

THE tuberculosis death rate in New York City in 1930 averaged 73 per hundred thousand population and in 1950, it may be recalled, was down to 29. One is apt to think of the mortality rates from tuberculosis in recent years as comparatively low especially as against those mentioned for the earlier part of the present century. On the other hand, we must still be reminded that the number of deaths from 1930 to 1949 inclusive recorded in this city -- and quite a few additional ones occurred out of town -- totalled no less than 75,030. One doesn't generally think of tuberculosis as an epidemic, at least to be compared with the former dreaded acute scourges of the previous century, such as cholera, smallpox, yellow fever, and yet the largest number of deaths, for instance, from cholera in New York City in 1849 was responsible for but 5,071 deaths. Even though the influenza epidemic of 1918 was responsible for 12,562 deaths, it did not begin to equal the tuberculosis deaths during the recent five-year period 1945-1949, which totalled 15,575. It must be emphasized that tuberculosis is an epidemic, even if it evolves, as compared with more acute conditions, relatively slowly. There are records available of several communities, as for instance, in Norway, where can be seen quite clearly the comparative beginning of the tuberculosis epidemic arising in certain areas progressing northward and then falling back. Furthermore, the case fatality rate of tuberculosis, namely, the ratio between the new cases reported and the deaths annually as in 1950 in this country or in several others is still as high as 30 percent, almost one death in every third case.

In Each Borough

If one considers the mortality trend between 1930 and 1950 in the different boroughs of New York City this picture is presented. First, for the city as a whole, the rate was 73 and then 29 lately, a decline during that twenty-year period of sixty percent. In 1930, the tuberculosis death rate in the Borough of Manhattan was 126 and therefore 73 percent in excess of that of the city average. By 1950 in Manhattan the rate had come down to 55, or by 56 percent; that year, as compared with the city rate of 29, it was now 90 percent in excess of the city average. Between 1930 and 1950, the tuberculosis death rate in the Bronx dropped from 55 to 19, or by 65 percent; in Brooklyn, from 56 to 23, or by 59 percent; in Queens, from 46 to 19, also by 59 percent; and in Richmond, from 60 to 29, or by 52 percent.

In Each Health Center District

Reference has been made previously to the development of neighborhood health services during the early 1930's and the division of the city into thirty Health Center Districts for more effective public health administration. It is therefore worthwhile to review the trend of tuberculosis during that period in these different sections of the city (see p. 70).

In 1930, speaking from a quantitative standpoint, the largest number of deaths from tuberculosis in the Borough of Manhattan was first in Central Harlem; second, in the Lower West Side District; and third, in the Lower East Side. In the Bronx the largest number occurred in Mott Haven, next in the Morrisania District. In Brooklyn the largest number of deaths was in the Fort Greene District; followed by Red Hook-Gowanus District, and by Williamsburg-Greenpoint. In Queens during that period the largest number of tuberculosis deaths occurred in the Astoria-Long Island City District; on Staten Island, in the so-called St. George Division.

Relatively, with respect to the population in each of those districts, the tuberculosis death rate in 1930 in Manhattan was highest in Central Harlem where it was 251 per hundred thousand population while the city rate averaged 73 (see p.71). The second highest rate was among residents of the Lower West Side, 154; the third, in East Harlem, 136. In the Bronx at that time the tuberculosis death rate was highest in the lower section of the borough, the Mott Haven District, where the rate was 68. In Brooklyn the highest rate was in the Red Hook-Gowanus District, 110; followed by a rate of 98 in the Fort Greene section. Twenty years ago, the death rate in the Bedford District was still comparatively low, 55. In Queens the Astoria-Long Island City District had the highest death rate, 57.

During the three-year period 1929-1931, in seven of the thirty Health Center Districts of New York City the tuberculosis mortality rate was above 75 per hundred thousand population (see Fig. 10). Five of them were in Manhattan: the Kips Bay-Yorkville District, the Lower East Side, East Harlem, Lower West Side District, and Central Harlem. The rate for the city averaged 73 and those of the districts just mentioned were respectively as follows: 75, 118, 131, 163 and 244. In the remaining two Health Center Districts of Manhattan, Riverside and Washington Heights, the rates were respectively 70 and 71.

Only two districts in Brooklyn had higher rates than 75 during the three-year period 1929-1931: the Fort Greene section, 94 and, Red Hook-Gowanus, 101. It is to be noted that at the time the lowest death rate in the city for any Health Center District was in the Gravesend area of Brooklyn where the rate averaged 31.

Twenty years later, namely during the three-year period 1949-1951, the death rate for the entire city averaged 30 and in only one district, Central Harlem, was it higher than the 75 average of the previous years. There it was now half of what it was formerly, namely, 119.

In 1950 there was a slight shifting of the relative position of districts with high rates; whereas, formerly, East Harlem was included among those above the average, now, with a rate of 38 per hundred thousand, it was no longer in that group. The three districts of Manhattan with the highest rates in 1950 were the Lower East and

West Side sections and Central Harlem. In the Bronx the Morrisania District had now to be included with Mott Haven as having a death rate above the borough average; likewise, in Brooklyn, the Bedford District which now had the highest tuberculosis death rate of the borough rather than the Red Hook-Gowanus. In Queens there was hardly any difference in the death rates of the various districts. In Flushing it was as low as 12 whereas in the Jamaica West section, which includes a certain number of the colored, the rate was only 19.

The problem posed with regard to tuberculosis by newer arrivals, especially the colored and Puerto Ricans, is indicated partly by the shift in the mortality from tuberculosis in certain Health Center Districts. For instance, in the Morrisania District of the Bronx, where formerly there were few deaths in the non-white population of late there has been a continuous increase of them until their number is four and five times what it was twenty years ago.

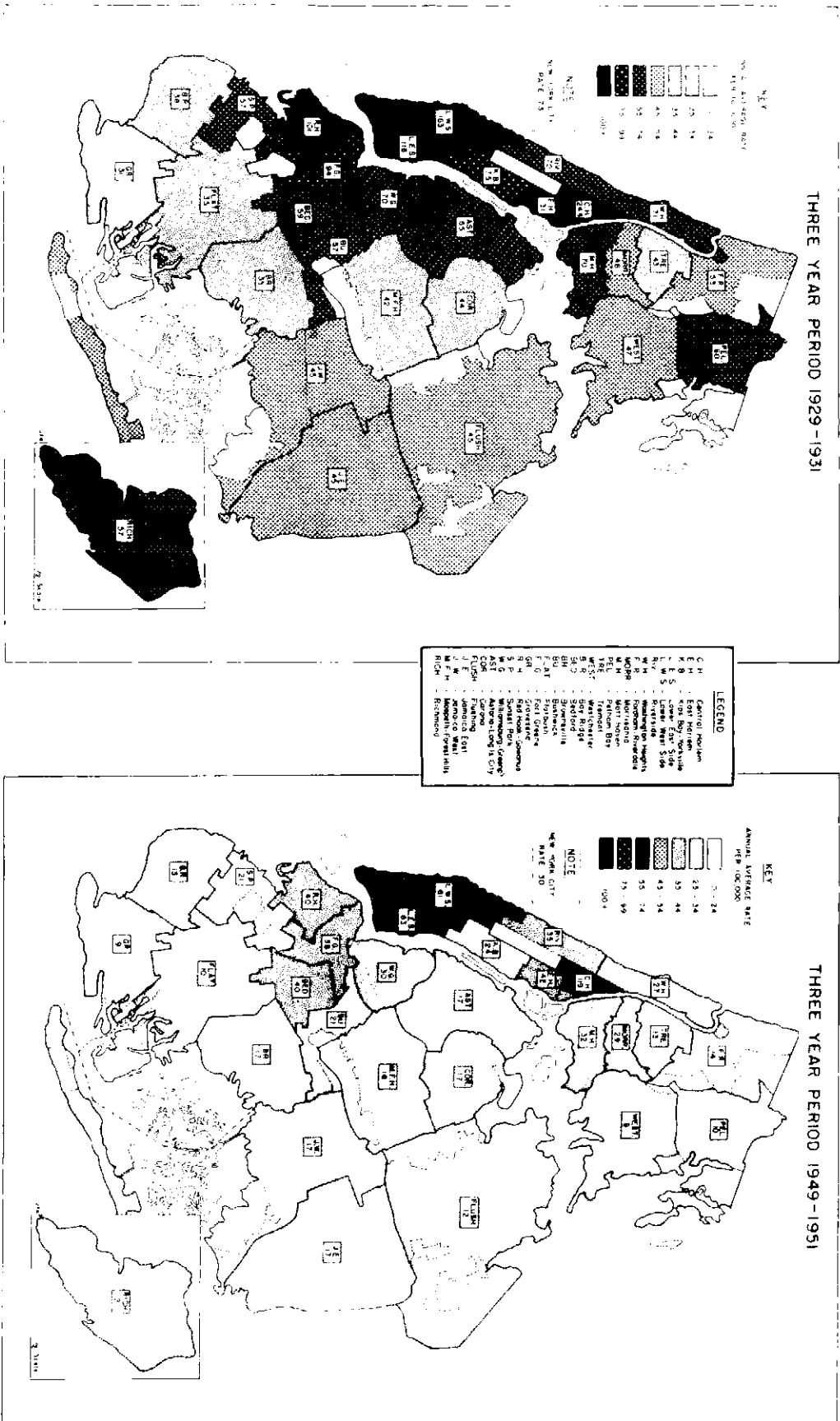
In Brooklyn, in the Bedford District especially, the growth of the problem of tuberculosis among the colored is indicated by the fact that the deaths from tuberculosis in 1950, numbering 99, were three times as numerous as what they were in the same district during 1929. It must be added that this increase in mortality has occurred in a larger population group now than formerly. Similarly, in the Fort Greene District there has been continuously a large number of deaths from tuberculosis of non-whites. In Queens this group is located particularly in the South Jamaica section of the Borough.

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Fig. 10

A GENERATION'S PROGRESS AGAINST TUBERCULOSIS IN NEW YORK CITY

DEATH RATE* IN EACH HEALTH CENTER DISTRICT



Residents only. Compiled from reports, Bureau of Records and Statistics, Department of Health, City of New York, by G. V. Drolet and A.M. Lowell, New York Tuberculosis and Health Association.

TUBERCULOSIS MORTALITY AMONG THE WHITE AND THE COLORED

BETWEEN 1900 and 1950 the white population of New York City increased from 3,378,000 to 7,120,000. The non-white population in 1950 was eleven times as great as it was at the beginning of the century, having risen from 67,500 to 783,000. The great majority of the non-white population is made up of Negroes; at the last census, the "other colored" numbered but 28,000. It is therefore natural that the number of deaths from tuberculosis in the non-white population has increased materially during the past fifty years (see p. 45).

In 1900 only 362 tuberculosis deaths among the colored were noted in the mortality of that year which totalled 9,630 for all racial groups (see Fig. 11). In 1919 the deaths of the colored were twice as numerous as formerly, namely 757 in the total mortality of that year, 8,498. By 1930 the deaths of the colored had risen to a thousand, 1,017 as against some four thousand deaths in the white population. The city's total was then 5,089. The largest number of tuberculosis deaths in the colored population, during the half century under consideration, occurred in the year 1936 when it reached a total of 1,146. More recently the deaths have again fallen below a thousand, and in 1950 they numbered 717 only; that year the tuberculosis deaths among the colored were practically one-third of the total mortality in the city.

In the first decade of the present century the tuberculosis death rate among the colored ranged from 511 per hundred thousand population to as high as 606. During the second decade it ranged between 422 and 594. During the third decade, namely from 1920 to 1929 inclusive, it was dropping materially but it still ranged between 257 and 383. During the fourth decade it remained serious but at a lower level, namely, between 209 and 298. Finally, between 1940 and 1950 though starting at 204, the rate went down to 92 in the last year mentioned.

It is of interest to note that in 1900, while the tuberculosis death rate among the colored was 536, it was slightly under twice the white rate, which was 274 in that year. In fact, for a few years prior to and around 1900, the ratio was even less; it was not until 1910 that it began to rise when at that time it was 2.8 times that of the white population. It seems to suggest that in those earlier days a material proportion of the colored were probably domestics or resided in the homes of families of white people sharing to a relative extent their food supply and their probably less crowded homes. Later with the great increase in the Negro population which took place and its concentration in congested areas they became fully exposed to all the dangers that a communicable disease like tuberculosis holds under such conditions. By 1925 when the colored tuberculosis death rate was 309, it had become four times as high as the white rate which was 77. In 1950 this same ratio is found since the rate, already mentioned, of 92 is to be compared with the rate of 23 in the white population.

Between 1900 and 1950 the tuberculosis death rate of the colored fell from 536 per hundred thousand to 92 being therefore 83 percent lower now. At the same time, that of the white population was dropping down from 274 to 23, or by 92 percent. In the light of today, the tuberculosis death rate of 92 per hundred thousand population among the colored in 1950 is considered indeed unduly high. And yet it is very interesting to see how it compares with that of other racial groups when they were first caught in the maelstrom of life in a great city like New York. During the four-year period 1918-21, among residents of New York City born in Finland the death rate from tuberculosis of the pulmonary type only was 342 per hundred thousand, and among the 203,450 Irish enumerated at the census of 1920 the rate was 306, or more than three times the present rate of the colored. Even among 21,000 Scotch residents, the rate at that time was 181 or twice that of the colored now. And among the then native-born Americans, 3,620,000 in New York City, the rate was still 108 per hundred thousand population.

It is also worth noting that when tuberculosis among Negroes alone is considered, that is exclusive of the rate in other colored people, it is slightly lower than that of the second group. In 1950, for instance, the tuberculosis death rate of Negroes was 90, whereas that of the "other colored" was 121 per hundred thousand. It has however been previously remarked that the latter include an unusually higher proportion of men in the upper age brackets where tuberculosis is more rampant these days.

Separate information with regard to mortality from all forms of tuberculosis among Negroes only is available within each borough for the twenty-five year period between 1925 and 1950 (see p. 47). As well known there are marked differences in the tuberculosis rate in the different sections of the city for all groups of the population. In 1925 when the tuberculosis death rate among Negroes averaged 301 per hundred thousand in the city as a whole, it was 316 among those residing in Manhattan and 255 in Brooklyn. In Queens it was 146 or only half of the city average rate.

By 1950 the Negro tuberculosis rate in Manhattan had fallen by two-thirds, being now 100. In Brooklyn it was 93; and, in Queens, 77. The rates for the Negro residents of the Bronx are not altogether significant because of the small number of deaths involved at times and the relatively great changes that have taken place recently with the spread of the Negro population into the lower part of the Borough. However, when we look over the five-year period 1945-49 it would seem to suggest that at the present time the tuberculosis death rate among the Negroes in the Bronx is higher than in Brooklyn, though less than in Manhattan.

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