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MUNICIPAL SANITATION IN NEW YORK AND BROOKLYN.

In the article on "Municipal Sanitation in Washington and Baltimore," published in THE FORUM for August, special attention was called to the differences between the death-rates of the white and of the colored race, and to the importance of taking these into consideration in comparing the mortality of different districts in those cities for the purpose of estimating their relative sanitary condition. In studying the vital statistics of New York and Brooklyn, the race differences in the white population of different districts are also of great importance.

The figures of the Eleventh Census show that on June 1, 1890, New York had a population of 1,515,301, occupying 81,828 dwellings on 25,741 acres of ground, giving 58.87 persons to the acre, and 18.52 persons to a dwelling. At the same time, Brooklyn had a population of 806,343, occupying 82,282 dwellings on 18,084 acres, giving 44.59 persons to the acre and 9.80 persons to each dwelling. New York was, therefore, much the more densely populated of the two cities, although a larger proportion of the business population lived outside the city limits than was the case in Brooklyn. Of the population of New York, 25,674 were colored, including 1,970 Chinese. To distinguish race differences among the whites, the best means at our command is a classification by the birthplaces of the mothers. According to this, New York contained 334,725 Americans; 55,572 English and Welsh; 399,348 Irish; 19,627 Scotch; 16,239 French; 403,784 Germans; 80,235 Russians and Poles; 9,647 Canadians; 13,311 Scandinavians; 15,555 Hungarians; 12,287 Bohemians; 54,334 Italians, and 74,963 other foreigners, or persons of unknown race. New York has a larger Irish population than any city in Ireland, and, of German cities, only Berlin, Vienna and Hamburgh exceed it in number of German population. Brooklyn in 1890 contained 10,946 colored inhabitants; 268,097 Americans; 50,379 English and Welsh; 196,372 Irish; 14,195 Scotch; 4,777 French; 195,663 Germans; 7,581 Russians and Poles; 7,200 Cana-

dians; 21,178 Scandinavians; 896 Hungarians; 205 Bohemians; 12,454 Italians, and 16,400 other foreigners, or persons of unknown race.

New York, therefore, contained a greater proportion of Irish, French, Germans, Russians, Hungarians, Bohemians and Italians, than Brooklyn, while Brooklyn had the greater proportion of Americans, English, Scotch, Canadians, and Scandinavians. The number of persons in most of these groups is large enough to make the death-rates of the different groups fairly comparable, especially if these rates are taken, not for a single year, but for several successive years. During the sixteen years from 1875 to 1890 inclusive, the annual death-rate of New York, excluding still-births, varied from 31.3 to 23.4 per thousand, having been highest in 1881–82, and lowest in 1877–78. From 1886 to 1890, it fell from 27 to 26 per thousand. During the same period, the Brooklyn death-rate varied from 26.3 in 1875 to 21.0 in 1878; 25 in 1882, 22.6 in 1886, and 24.6 in 1890. The mortality decreased in New York and increased in Brooklyn from 1886 to 1890, but was always lower in Brooklyn.

For the year 1890, the death-rate of London was 20.8; of Paris, 24.9; of Berlin, 21.2; of Vienna, 25.2; of Brussels, 22.3; all being much below the New York death-rate. If approximate life-tables be calculated for New York and Brooklyn for the year ending May 31, 1890, it will be found that of a million white children born in Brooklyn, 511,049 would have been males, and 488,951 would have been females. If now these infants had been subjected throughout their lives to the same influences tending to produce death as were acting during the year referred to; at the end of the first year 386,589 males and 387,182 females would have survived, and at the end of the thirty-fourth year 242,478 males and 257,433 females would have remained alive; that is, more than half the males would have died before they became thirty-five years of age. In New York, the number of male infants would have been 514,545, of whom 379,630 would have survived the first year, and 270,569, or about half, would have been alive at the age of twenty-five. The expectation of life of a white male infant at birth was, in New York, 30.32; in Brooklyn, 32.88; in Baltimore, 37.01; and in the District of Columbia, 39.20 years. At the beginning of the twenty-fifth year of life, the expectation of life of a white male in New York was 29.31; in Brooklyn, 32.04; in the District of Columbia, 34.50, and in Baltimor[illegible] 35.82 years.

Turning now to the death-rates in different wards and districts,

we find that in New York the annual mortality varied from less than fifteen to more than forty-five per thousand, and in Brooklyn from less than fifteen to more than forty per thousand. The causes of these great differences in the mortality cannot be fully ascertained from the statistical data at our command; but some important indications are discoverable. In Washington and Baltimore, a considerable part of the differences in different districts is due to the different proportions of the white and colored populations in them; in New York, a considerable part is due to the different proportions of Irish, Germans, Russians, Italians, *etc.*, in the different localities. The high death-rate in both New York and Brooklyn is due largely to the high death-rate among the Irish, because of the comparatively large number of this class of the population; although the death-rate of the Bohemians and Italians was higher than that of the Irish, because of the higher mortality among the Bohemian and Italian children. For persons of fifteen years of age and upward, the average annual death-rates during the six years above referred to were as follows: In New York, Irish, 28.0; colored, 23.6; Scotch, 21.9; English, 20.8; Bohemians, 20.3; French, 17.9; Germans, 17.0; Canadians, 16.7; Americans, 15.9; Scandinavians, 13.4; Italians, 12.3; Hungarians, 8.5; Russians and Poles, 6.21. In Brooklyn, Bohemians, 31.8; Irish, 22.7; English, 17.0; Scotch, 16.4; Germans, 15.5; French, 14.4; Canadians, 14.3; Americans, 13.9; Scandinavians, 9.1; Italians, 7.9; Russians and Poles, about 5.4; Hungarians, 5.2. These great differences in race death-rates are of much interest and importance, and they go far toward explaining the comparatively low death-rate in certain crowded tenement-house districts, as for example in the seventh, tenth and thirteenth wards in New York, which are inhabited largely by Russian and Polish Jews. The low death-rate of the Jewish race has been known for a long time; it does not fully appear in these figures, because a considerable number of those whose mothers were born in Hungary and Germany are of this race, with low death-rates. If it were possible to separate them, the death-rate of the Germans would stand at a much higher figure.

This low death-rate of the Jewish race, under circumstances of poverty, overcrowding, want of fresh air, and uncleanliness of various kinds, is not only a matter of great scientific interest to the physician and sanitarian, but it is of great sociological importance. It must not, however, be supposed that the unsanitary conditions of tenement-house life have no effect upon the Jews. Comparing the death-rates

of the Russians and Poles with those of more than sixty thousand Jews of the better classes, as given in Census Bulletin No. 19, we find that for persons under fifteen years of age the death-rates were, for the Russians and Poles in New York City, 28.67; for the Jews throughout the country, 9.90. This last figure is probably too low; but it is perhaps safe to say that the death-rate of the New York tenement-house Jewish children under fifteen years of age is double that of Jewish children of the same ages throughout the country living under more favorable conditions.

The heavy death-rate of Irish adults in New York is so important in the study of the sanitary conditions of the city, and of means to improve them, that a few more figures are given, even at the risk of wearying the reader. The death-rate of married men from fifteen to forty-five years of age was for the Irish 23.7, and for the Germans 13.1; and of married women of the same ages, for the Irish 23.9, and for the Germans 10.8. For single men from fifteen to forty-five years of age, the death-rate was for the Irish 20.9, for the Germans 11.0; and for single women of the same ages, for the Irish 10.1 and for the Germans 5.0. This means that for these ages the death-rate of the Irish was nearly double that of the Germans for both the married and single of each sex. Taking persons of forty-five years of age and upward, the death-rate of the married men was for the Irish, 44.0, for the Germans, 36.9; of the single men, Irish, 82.8, Germans, 65.6; of the married women, Irish, 44.2, Germans, 25.0; of the single women, Irish, 57.2, Germans, 46.8. At ages under forty-five, therefore, the death-rate of the married was greater than that of the single, while above that age the reverse was the case.

If upon a map of New York City be indicated the average annual death-rate of each ward and sanitary district during the six years ending May 31, 1890—as has been done for a special report, soon to be published, made to the Superintendent of the Census, by whose permission certain data given therein are used in this paper—it will be seen that the heaviest death-rates occurred in the low-lying water-side districts of Wards 1, 2, 4, 5, 7, 18, 20 and 22, and in portions of Wards 12, 14 and 15. In the districts under twenty feet in average altitude, the death-rate was 31.5; for the children under five years of age, 118.6. In the districts from twenty to forty feet high, it was 28.3; for children under five years of age, 110.6. In the districts from forty to sixty feet high, it was 24.8; for children under five years of age, 100.6; and in the districts from eighty to one

hundred feet high, it was 17.9; for children under five years of age, 74.5. The same gradation is found in Brooklyn. But the ancient topography of these two cities is of special interest in connection with the death-rates of certain districts. The old marshes and streams, which have been filled in or covered so long that very few remember their existence, still indicate their effects on the mortality of their ancient sites, especially in the death-rates from malarial fevers, pneumonia and diarrhœal diseases, as will be seen by comparing the shaded maps with the old map in the report mentioned above.

The relations between density of population and death-rates in different districts in New York are complicated by the differences in the race and age distribution of the population in these districts, which require careful consideration to avoid the fallacies that the use of the mere gross rates would inevitably lead to. Some of the most crowded districts are occupied by Jews having a very low death-rate, or by a population in which the number of adults is relatively large, and give a lower death-rate than those in which the number of children is proportionately greater. If we take the native-born, of native-born parents, or the Americans, we find that the death-rates are: in the districts having less than one hundred persons to the acre, 21.8; in those having from one hundred to two hundred to the acre, 31.0; in those having from two hundred to three hundred to the acre, 34.1, and in those having more than three hundred to the acre, 43.1. It would be an error, however, to conclude from this that the increased density of population alone produced the increased mortality. The native-born Americans who are found in the crowded tenement-house districts are those who have failed of success because of physical weakness, intemperance, indolence, *etc.;* they are largely the *dégenerés* of our people, and in a tenement-house district their death-rate, and especially the death-rate of their children, is usually higher than that of any other race, except that of the Irish for the adults and that of the Italians for the children.

What are the causes of the heavy death-rate among the Irish? The most prominent are consumption, pneumonia, and alcoholism and its consequences, in the form of diseases of the arteries and of the digestive organs and the kidneys. In each 100,000 persons of each race living in New York during the six years ending May 31, 1890, consumption caused annually 774 deaths among the colored, 646 among the Irish, 329 among the Germans, 325 among the French, 205 among the Americans, and 98 among the Russian and Polish Jews.

In Brooklyn during the same period the corresponding rates were, colored, 531; Irish, 453; Germans, 296; French, 253; Americans, 181; and Russians and Poles, 77. For all England, the death-rate from consumption in 1890 was 168.2 in 100,000; in Dublin it was 390 in 100,000. These are terribly significant figures, and it is evident that the enormous mortality from consumption among the negroes and the Irish is not due solely to poverty or overcrowding. During the same period, alcoholism caused, in each 100,000 persons of each race in New York, 31 deaths annually among the Irish, 10 among the Germans, 9 among the Americans, 6 among the colored, 3 among the Italians, and 1 among the Russians and Poles; and Bright's disease caused 142 deaths among the Irish, 67 among the Germans, 54 among the Americans, 27 among the Italians, and 18 among the Russians and Poles. For all England, the death-rate in 100,000 from alcoholism during 1890 was 7, and from Bright's disease, 25. On the other hand, the death-rates from measles, scarlet fever, diphtheria, and other children's diseases are comparatively low among the Irish and high among the Americans.

Both New York and Brooklyn have well-organized health departments, which employ a large number of inspectors, and the tenement-house class of the population is as carefully looked after as it is in any city. Each city has a sufficient, though not a superabundant, supply of good drinking-water, which there is no reason to suppose has conveyed specific causes of disease. During the six years ending May 31, 1890, the average annual death-rate from typhoid fever in 100,000 of population was, for New York 24.27; Brooklyn, 23.13; Baltimore, 40.17; Washington, 75.55. Both New York and Brooklyn are sewered cities, but many of the New York sewers are of faulty construction and in places are too level, or are leaky and pollute the soil; nevertheless, there is no evidence that the condition of the sewers in any locality has had any special influence upon the death-rates, except in so far as the soil-drainage is influenced thereby. The average annual death-rate in 100,000 of population from malarial fever was 24.62 in New York and 32.62 in Brooklyn, being specially high in the low-lying waterside districts. The corresponding rate in Baltimore was 41.51, and in Washington 44.44. Each city has fair hospital accommodation for cases of contagious disease, and a disinfecting plant at the command of the health department. The death-rate from diphtheria and croup has increased within the last fifteen years; during the six years ending May 31, 1890, it was,

for each 100,000 of population, in New York, 181.63; in Brooklyn, 164.42; in Baltimore, 80.13; in Washington, 59.64. The corresponding death-rate from scarlet fever was 52.19 in New York, 42.48 in Brooklyn, 13.11 in Baltimore, and 21.69 in Washington. Diphtheria, diarrhœal diseases, consumption and pneumonia, taken together, gave an annual death-rate of 11.8 in New York and of 9.8 in Brooklyn per thousand of population, and all of these are more or less preventable diseases.

It is a question of great practical interest and importance as to how far the defective cleansing of the streets, which at times prevails, has an influence upon the death-rate. That accumulations of decaying organic matter in the streets tend to increase the prevalence of certain diseases, especially when these accumulations become dry and pulverized and are blown about in the form of dust, may be accepted as a fact; but it is at present impossible to demonstrate it by statistics. The death-rate from diseases of the respiratory organs is greatest in New York in January and March, and a large proportion of these diseases is due to dust-borne micro-organisms; but cold also has its influence, and at present we cannot estimate the relative importance of the two, though we can control the dust of the streets much more easily than we can control temperature and winds.

The death-rates of certain low-lying districts in New York and Brooklyn can certainly be diminished by engineering methods directed toward securing better soil-drainage and less soil-pollution, and this is true especially of the malarial death-rates. It seems probable that to effect a substantial lowering of the mortality in the great majority of those districts in which it is more than twenty-two per thousand annually, it will be necessary to make a careful study of race peculiarities—with special reference to the liability to such diseases as consumption and pneumonia on the part of the Irish adults, and to certain other forms of disease on the part of the German and Italian children—with a view to devising special means of prevention, adapted to the habits and customs of these different peoples. For example, if we take the average death-rate of a thousand children under fifteen years of age for the six years ending May 31, 1890, we find that it was for the Bohemians, in New York, 82.6, in Brooklyn, 90.9; for the Italians, in New York, 76.4, in Brooklyn, 53.6; for the Scandinavians, in New York, 57.3, in Brooklyn, 45.5; for the Irish, in New York, 50.9, in Brooklyn, 43.8; for the Germans, in New York, 47.0, in Brooklyn, 44.3; and for the white Ameri-

cans, in New York, 54.0, in Brooklyn, 45.8. The heavy death-rate among the Bohemian children was due largely to diphtheria, diarrhœal diseases, and convulsions; that among the Italian children was caused by measles, diarrhœal diseases and diseases of the lungs, which last caused twenty-four deaths per thousand among them in New York, while the corresponding rate for Americans was 10.0; for the Irish, 9.6; for the Germans, 8.5; and for the French, 6.9.

In one race, the food seems to be a prominent cause of extremely heavy death-rates in infancy and childhood; in another, foul air appears to be specially pernicious. Scarlet fever is much more fatal among English, Canadian and American children than it is among the French and Italians. Tubercular meningitis is twice as fatal among the Bohemians as it is among other nationalities. This is not the place to discuss details of this sort, and I give these few specimens merely to show why it appears to me that one of the most important steps which can be taken toward lowering the death-rates in New York and Brooklyn is to obtain accurate information with regard to the death-rates of the different races in different parts of these cities, and the causes of the great differences which will be found in them. The health departments possess a part of the information requisite, in the form of the records of deaths; but they do not possess the corresponding information, with regard to the living population which furnishes these deaths, to enable them to calculate the death-rates in the details which are required to settle the difficult questions which arise. They must know for each unit of area which they select, whether it be ward, district, or tenement-house, not merely the number of inhabitants, but the number of each sex, of each race, of each of certain groups of ages, as for example, under one, under five, from five to fifteen, from fifteen to forty-five, from forty-five to sixty-five, and from sixty-five upward. This information should be obtained by the municipal authorities at least once in the interval between the United States censuses of 1890 and 1900, and it would be best to date it on January 1, 1895. Such a municipal census, with the compilation of the data, would cost the city of New York about one hundred thousand dollars; and if the work were properly done, it would be the best investment of that amount of money which the city could possibly make.

It is probable that a considerable part of the extremely heavy death-rates from consumption and pneumonia in New York is due to certain houses and apartments that contain an unusually large num-

ber of the micro-organisms which cause these diseases; for the majority of cases of pneumonia appear to be due to micro-organisms. A room in which there have lived two or three persons affected with consumption, who have taken no precautions to disinfect their sputa, becomes an infected room. The dust containing the spores of the bacillus of tubercle is scattered in the air by the processes of sweeping and dusting, and much of it settles on the ledges over windows and doors, on the beds, on the walls, to be again displaced by air-currents or dusting, and some of it to be inhaled. A room in which there has been a case of scarlet fever, or of diphtheria or spotted typhus, is carefully cleansed and disinfected. But one in which there have been a dozen cases of consumption is not thus treated, no matter how dirty it may be, since the existing laws and regulations do not require it; and public opinion as yet would hardly justify the health department in demanding and enforcing it.

If the records of the Registrar of Vital Statistics for the last six years were examined for all the deaths from consumption which have occurred in New York in the second, fourth, fourteenth and fifteenth wards, including the deaths in hospitals of persons coming from these wards, and locating each case by street and number of house, I have no doubt that the death-record of certain houses for consumption would be found to be ten or fifteen times greater than that of others, and that certain foci of infection might thus be located with considerable precision. The record could be carried back only a few years, because it has not been customary to charge the deaths occurring in hospitals to the houses from which the patients came. The practical difficulty in the way of obtaining such definite, accurate information as is required to deal efficiently with the foci of infection of consumption, pneumonia, and diarrhœal diseases, is one of expense.

One object of this paper is to explain to intelligent citizens, not only of New York and Brooklyn, but of all other large cities, that this detailed and classified information about deaths in different localities, at different ages, from different causes, in different races, is desired not merely to satisfy the idle curiosity of a few speculative philosophers or physicians, but to locate the great leaks through which the health, energy, life and money of the community are being wasted, in order that the remedies may be applied in the right direction, and at the right spots, and that the cost and labor of really practical, useful municipal sanitation may thus be made as small as possible.

JOHN S. BILLINGS.