

THE
Sanitation of Rochester

—BY—

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GEORGE W. GOLER, M. D.

My object in presenting such a subject as this for discussion is to show the changes that have been wrought in the equipment and methods of work of the city Health department during the past years, and the advantages that have accrued from the expenditure of money and labor in promoting health and preventing disease. To do this it will be necessary briefly to pass over the history of the Health department, its organization, past and present, some of the obstacles its officers have met with in bringing it to its present stage of efficiency.

In the early years of the Health department, as within a few years past, the health board convened weekly or bi-monthly to receive the reports of its health officer and inspectors. These were presented verbally in greater part and so far as the records show there is, up to within a very few years, nothing but notes in the minutes to tell us what was done with these reports, save that the clerk was directed to draw an order upon the owner of a piece of property which, by the board through this report of its health officer or inspectors, was declared to be a public nuisance, and the said owner was ordered to abate the nuisance within a given number of days or pay a fine, to be collected by legal proceedings brought through the office of the city attorney.

A careful examination of the existing early records shows but a very small number of nuisances abated, and we are left entirely in doubt as to the enforcement of most of the board's orders.

Under the old regime no examinations of food were made. Milk and meat supplies were not, as now, required to be made by legislative enactment. Contagious and infectious diseases were guarded by small attempt at quarantine. Scarlet fever, diphtheria, croup, typhoid fever and other diseases were at times epidemic and attended by frightful mortality; even smallpox and cholera visited and terrorized the city more than once. It is not possible, however, to ascertain the number of cases or the percentage of death that attended these cases in the early days of Rochester; no records are available, for none were kept.

A record of deaths did not begin to be preserved until 1870, and it was not until several years later, about 1876, that an approximately accurate sum of our mortality was compiled. The death rate is not thought to be available for statistical purposes prior to 1880.

Marriages and births were not recorded in the city of Rochester until 1876. Even at the present time they are, owing to the careless methods of physicians, clergymen and midwives, valueless for statistical purposes.

It may not be apparent to every one why these statistics should be carefully kept or the importance that may attach in failure to report deaths, marriages, and births; but when we are told that hardly a day passes but for some purpose a marriage must be proven, to insure, perhaps, the fair name of a woman; a birth proven to insure in law the legitimacy of a child; or a death proven to insure some widow a legal claim or a pension, the importance of correct records of vital statistics cannot be gainsaid.

Whatever may be said of the work of the Health department between fifteen and thirty years ago, it must be remembered that the science of sanitation was hardly born; and while the efforts of the men of those days were principally, if not wholly, directed to the abatement of old vaults, cesspools, dumps, foul cellars and in combat against epidemic diseases, it must be acknowledged now that if those men had had a measure of the correct sanitary knowledge that we to-day possess, they could have done little more because they would not have been backed by public opinion sufficiently strong to aid them in their labors.

However imperfect were the conditions in the Health department, the ground upon which many of Rochester's dwellings stood, the city's water supply, its drainage and sewerage were far worse. Many of the dwellings of early Rochester citizens were built on the lower ground, in the central part of the city, where their sites received the surface drainage from a large outlying district of higher ground. As in these early days none, or at best, the most primitive means existed for the removal of house drainage, the occupants of these dwellings fouled with house refuse the adjacent ground upon which other dwellings were soon to be erected. The soil within the city limits was contaminated in two general ways: either by having directly drained into it cesspools or vaults or by using an excavation, a deserted quarry, or part of an old watercourse, as a dump for a mixture of animal and vegetable refuse. When in after years the site of this made ground was excavated for that modern sanitary abomination the house cellar, the house dwellers in very many cases became the victims of some one of the infectious diseases.

Our water supply, like the water supply of most cities at that time, was from dug wells of greater or less, usually less, depth. These wells, often wholly unprotected from contamination by the filth-laden surface drainage of the immediate vicinity, offered a ready means for the propagation of malarial, typhoid fevers and other diseases. When not responsible for any disease of a distinct type the water so obtained operated with other factors to lower vital resistance and produce a condition of the individual organism that would make it an easier prey for diseases of different kinds. The introduction of an excellent water supply from Hemlock lake did not readily put an end to the disease-breeding city well. For some years after water had been piped from Hemlock lake to the city, many of our people still continued to use well water. There are more than 1200 wells still remaining in the city, although but few of them are used. The few in use are not only dangerous to the families residing on the premises on which they are situated; their dangers often extend to those living in the vicinity and may extend farther still. In summer, in the poorer districts, among those people who do not take ice, a well often furnishes cold water for a little community who, while they find in the water cool refreshment, do not consider—for they do not know—that its very sweetness comes from the filtrate of some near-by stable, vault, or filth heap.

The popular but erroneous idea of a well is that of a shaft sunk into the earth to a certain depth until it comes upon a spring of pure water issuing from the very bowels of the earth. This spring of purest water is supposed to feed the well. The scientific and true idea of a well is very different. Every well derives its water supply from surface drainage; either surface water flowing along different strata of rock from a distance until it meets the sunken shaft, or the surface drainage of the immediate vicinity filtering through the soil into the well. In other words, any well must be looked upon as an inverted cone whose apex is the bottom of the well that drains the base of the cone which extends a varying distance from the site; the area drained bearing in size a relation to the soil and underground strata of rock in the neighborhood.

From what has been said of wells it follows that they must be dangerous in proportion to the amount of organic matter in the soil of the area they drain. As the number of dwellings and density of population bears a direct relation to the amount of organic matter in the soil, the more dense the population the greater the danger from wells.

As near neighbor to the early well we find the open drain, forerunner of the modern sewer. In the earliest days natural drains, ancient watercourses, were utilized as open drains, and later to some extent served as ditch drains, along which house drainage and rainfall alike were carried to their final destination. When the city began to be laid out in streets many of these old watercourses were filled up without first providing for the rainfall and surface drainage, which still found its way to and along these old levels. The result was and is to-day that dwellings built along these old natural drains are not healthful; the house cellars and walls are damp, and their inmates would be found to furnish a large number of the sick and dead of our city.

At first these open ditches served the double purpose of removing rainfall and house waste, but the unsightliness of these ditches and the offensive smell led to the establishment of the covered drain or box sewer, later to the stone sewer, then in an intermediate stage to the cement pipe sewer, and lastly to the sewer of vitrified pipe, and for trunk sewers the circular or egg-shaped sewer of heavy masonry, brick or stone. The early open ditches were not so bad as they have been painted. While unsightly and malodorous they were open to that greatest of disinfectants, sunlight, and were by this means greatly purified. But later, when it became customary to place a square box of planking in a ditch and cover the planking with earth the unsightliness was removed, but with the removal came a difficulty which was not readily understood by the people of those days. The odor was less, the eyes no longer offended, but a little way under-

neath the ground a reeking cesspool was slowly being made from the leaking sewer. As months and years went by the soil became polluted for a considerable distance from the leaky drains. Heavy rains caused them to overflow and their contained filth backed up into the imperfectly-drained cellars. Owing to meteorological conditions various changes in the soil took place considerably affecting health. When barometric pressure was low air entered the soil and became charged with emanations from decomposing matter in the soil. With changes in barometric pressure, atmospheric temperature and humidity, the varying rise and fall of the ground water, the air in the soil surcharged with sewerage pushed above the surface and fouled the air of homes situated adjacent to them.

Co-incident with considerable changes in the meteorological conditions outbreaks of contagious diseases occurred. The stone cement pipe sewers were an improvement upon the old box sewers, but even they were often very imperfect. Until about 1880 the stone sewers were built square in form with plank bottoms. They were not tight and they were of shallow depth, allowing of accumulation of filth within and fouling the ground for some distance without. The cement pipe sewers were rough and imperfectly joined. Time and the action of sewage produced disintegration of the rough cement pipe through which sewage found its way to the surrounding ground, converting it into a quagmire. Added to the ditches and imperfect sewers, which daily aided in polluting the soil and air in and around our dwellings, were myriads of vaults and cesspools. Although many houses had facilities such as they were, for disposing of sewage, all did not avail themselves of these facilities—the owners in many cases preferring to carry a drain, often of wood, back into adjacent ground or into the vault. When vault and cesspool were separate they most often consisted of a hole in the earth, sometimes boxed in with rough boards,—rarely tightly built of stone or brick—into which a box drain emptied. These cesspools, or cesspool and vault combined, formed the common type of receptacle for house drainage and human excrement. Thousands of such vaults and cesspools dotted the city everywhere, and, to make matters worse, they were often multiplied by covering over a full vault or cesspool with earth and digging a new hole alongside of it. How many of these vaults and cesspools were formerly to be found we do not know, but we do know that at the present time, with a better system of sewers extending to nearly all parts of the city, with improved fixtures and plumbing apparatus that makes it safe to have retiring conveniences within the house, more than 15,000 vaults are in use in Rochester.

About 1876, as the city began rapidly to extend, it became necessary to remove human excrement. From the beginning until — it was collected in huge tanks and emptied into the river from the bridges at night.

Garbage was not collected by the city until 1879. Prior to that farmers and others collected garbage in small districts and carried it into the country in open, foul-smelling wagons. Most of the people were then forced to burn garbage or pollute the ground about their dwellings with house refuse.

Such, in general, were some of the conditions within the Health department and in the city up to a very few years since. The effect of these conditions upon the health of Rochester, taken with other factors which can not be estimated or entered into in this paper, may be seen by reference to the charts and tables.

Early in the present decade a reorganization of the working force of the department was begun by the Board of Health Commissioners. The board consisted, as formerly and now, of six commissioners, the mayor *ex-officio* president. To facilitate its work the board in 1891 secured its own clerk and attorney as paid officers of the board. In 1893 two medical inspectors were added. Co-incident with this increase in the number of employees old health ordinances were revised, new ordinances were passed, and all ordinances were more strictly enforced. A large volume of work was thus placed upon the Health board, and their weekly meetings were often extended until nearly midnight.

Late in 1893 the work of making orders upon property-owners who had violated the health ordinances, which until then had devolved upon the board, was by vote delegated to the health officer. Formerly when a nuisance was reported an inspector was sent to the site of the nuisance, where he made notes of the condition of the premises and usually reported verbally to the clerk, sometimes in writing, the result of his inspection. Upon the inspector's statement of the existence of a nuisance a legal citation was made by the clerk, signed by the health officer, requiring the owner to appear and be heard in his own behalf. If the owner or other authorized person did not appear an order was made requiring the owner to abate the nuisance within a specified number of days or pay a fine in default.

In the fall of 1893 the volume of business had increased to such an extent that it was

deemed wise to empower the health officer as executive officer of the board to make the orders upon persons violating the sanitary ordinances. The wisdom of this move may be appreciated when it is found that under the old plan not more than thirty cases could be disposed of in a single week, while now, in the busiest season, more than 100 cases have often been attended to in the same length of time. Under the old plan of doing business no records were kept save the minutes of the meetings and the file of orders made. A little later and up to 1893 records of inspections were entered in a book kept by each inspector. Late in 1893 a form was drafted consisting of a number of questions to be answered by the inspector when making an inspection, and these since modified to meet the department's demands, have been used to record every inspection made by the department's employees. Each inspection made is filed in the original and a transcript entered upon a sanitary register, together with the date and disposition of the report.

In 1893, 1215; in 1894, 1987; in 1895, 2525 nuisances of various kinds were abated. Many of these nuisances were of such a character as to require the report of a medical man having some special knowledge of sanitation. To any nuisance requiring for its adjustment more skill than that possessed by the ordinary inspectors the chief of the department gives his attention, and in his report to the health officer notes the special features of each case and the disposition which in his judgment should be made of it.

Closely allied and of equal importance to the Nuisance Bureau is the Bureau of Plumbing and Drainage. When in 1886 a State law was passed requiring the plumbing and drainage of cities to be inspected by an officer of the Health department, who should be a practical plumber, and prescribing certain rules and regulations for the construction of plumbing and drainage of cities, a law wise and far-reaching in its usefulness, was placed upon the statute books. Before the passage of this law the plumbing and drainage in many of our dwellings was done in a most unskillful manner. Tinsmiths and sheet-iron workers were employed to put in tin and galvanized iron pipe which rusted out; faulty pipe sewers, wooden box sewers were laid; old pumps, stove-pipe, and wooden troughs, open drains of any kind were maintained in cellars. Old closets of bad construction, laden with filth, without sufficient water flushing or ventilation were allowed to remain in dark hallways and in still darker cellars. Nearly all plumbing work was concealed by lath and plaster so that its defects could not readily be seen. So sharp had competition become between plumbers and other artisans who were then allowed to do plumbing work that both the grade of work and material employed became surprisingly low. Better work could not be done at living prices because there were no laws to keep all within bounds, to regulate the material used and the workmanship employed.

After the plumbing rules were adopted a gradual change was wrought in the plumbing work of our city. Tin and galvanized iron pipes were no longer allowed; mechanically-complicated and easily-fouled closets were not permitted to be used. Rules were adopted regulating the material to be used and the kind of work to be done in all cases, and these rules and regulations have been as strictly carried out as they would be if administered by a company of men doing business for private gain. While soil, air, and water were all more or less polluted, the city's food supply up to 1892 was guarded by no sales regulations. In 1891 an ordinance was passed prohibiting the sale or disposal for consumption of vegetables, fish, and meats that are not healthy, fresh, sound, and wholesome. At about the same time an ordinance was passed providing for the maintenance of sanitary conditions in slaughter-houses. Most important, however, was the ordinance passed relating to the keeping and vending of milk within the city. Those ordinances in their relation to the public health are of the greatest importance. Prior to their passage and enforcement quantities of bad meat, particularly beef and veal, were brought to the city and disposed of for food. It was and still is customary for some butchers, who cater to the trade of poor people, to buy old cows, bring them to the city, slaughter them and offer the carcasses for sale. Little calves—bob veal—but a few days old were frequently and are now occasionally offered for sale, although their flesh is known to be unfit for human food. Animals that, if found, would be condemned by the meat inspector, were taken to a slaughter house on the outskirts of the city, killed at night, their carcasses hurried to the markets and sold at a very low price to some rascally dealer.

One of these slaughter-houses deserves a short description: A filthy, fly-inhabited, tumble-down shanty, behind which flows a drain that receives the liquid refuse, blood, etc., from the slaughtered animals. Surrounding the house an enclosure in which stood over the hoofs in mud and filth several underweight baby calves and worn out milch cows waiting to be killed for food. The floors of this slaughter-house reeked with filth

from many slaughtered animals that had gone before ; the sides covered with alternate flakes of dried blood and old whitewash ; rusty and blood-stained chains for hoisting the dead animals depend from the roof, suspending the bodies of two or three dead calves ; racks of bones covered with buzzing flies, ready dressed to be sold for food. Such was the condition of more than one slaughter-house in Rochester before the meat inspector began his labors.

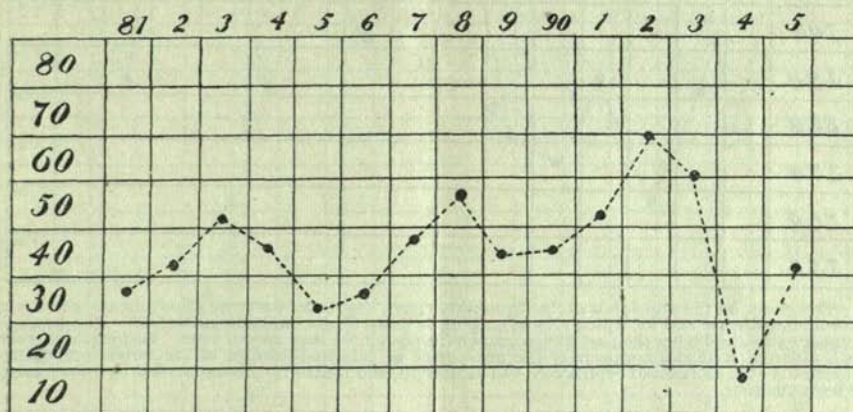
Evasions and attempted evasions of the law are still all too frequent. Three meat dealers have been convicted in the past year of selling meat unfit for food and more than three tons of meat, fish, and sausage seized and destroyed.

Until one slaughter-house is provided for the city, presided over by an expert in diseases of cattle, and a law is passed prohibiting animals killed elsewhere from being disposed of in the city before they have been passed upon by the expert and received his stamp and certificate, much bad meat will be sold, lives will be sacrificed and much serious bodily harm be done.

An ordinance regulating the keeping of cattle and sale and vending of milk was passed May 14, 1891, and went into effect June 15, 1891.

Before the passage of this ordinance and to a certain extent at present, cattle were kept in the city in most squalid quarters. Cows could be found, sometimes two or three in a stable, that had not been out of their stables for months. Some cows kept within the city limits, and many of them kept without the city, were fed almost wholly upon Buffalo feed, brewery grains or swill, a refuse obtained in malting, from which a greater part of the nutritious material, have been removed. It is obvious that cows so fed could but give an inferior quality of milk, poor in fats and total solids. Even had such milk been collected in a cleanly manner it would be totally unfit for human food ; but when we consider the manner in which such milk was and is to some extent collected—the dirty udders of the animals often caked with barnyard filth, the half-

TYPHOID FEVER DEATHS IN FIFTEEN YEARS.



The deaths from typhoid fever in 15 years have varied from 70 in 1892, to 18 in 1894. The continuance of this distinctly preventable disease, which is a disgrace to our civilization, should lead to the closest surveillance of our water, milk and food supplies ; to a rigid inspection of the plumbing, drainage, and cleanliness of all dwellings, schools, workshops, and factories.

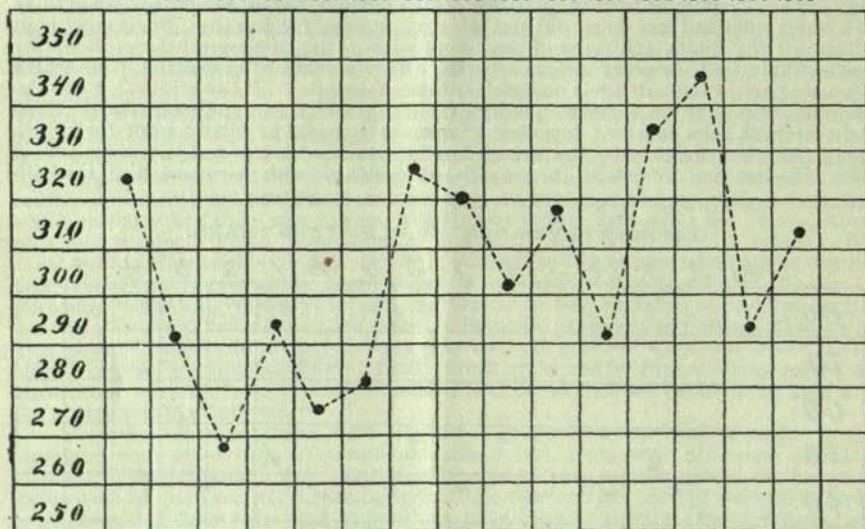
cleaned pails and cans—we can but wonder that so many people, especially little children, survive the dangers to which they were and are yet, to a considerable extent, exposed.

Milk coming from poorly-kept and even well-kept cows is subject to many dangers. As milk is one of the most highly nutritious substances, containing within itself all the elements necessary for the support of higher animal life, it necessarily furnishes one of the best foods for the fertile growth of all those low forms of vegetable life classed under the head of bacteria. Those organisms find in milk a soil upon which they may multiply with surprising rapidity. We find them in greatest number in the presence of that decomposing animal and vegetable refuse in or near barnyards and cow stables. As

has been pointed out before, from the filth of the yard or cow-stable to the milk apparatus of the cow and thence to the milk pail is a journey over which bacteria may travel with facility. Now, all bacteria that may find their way into the milk pail do not cause specific diseases; only a limited number of species of bacteria produce specific diseases as tuberculosis, typhoid fever and diphtheria. Those forms that do not produce specific diseases have the power of setting up fermentative or putrifiactive decomposition that change the character of good milk to bad milk and bad milk to worse. They so render milk unfit for food and in the digestive tracts of children and adults may produce diseased conditions attended by vomiting, diarrhoea, fever and various other disturbances. Those forms of bacteria that have the power of producing specific diseases—tuberculosis, typhoid fever, diphtheria—may find their way into milk; for, as in the various other species of bacteria they find in the refuse about the barnyard necessary food, heat, and moisture for growth and multiplication.

CONSUMPTION DEATHS FOR FIFTEEN YEARS.

1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895

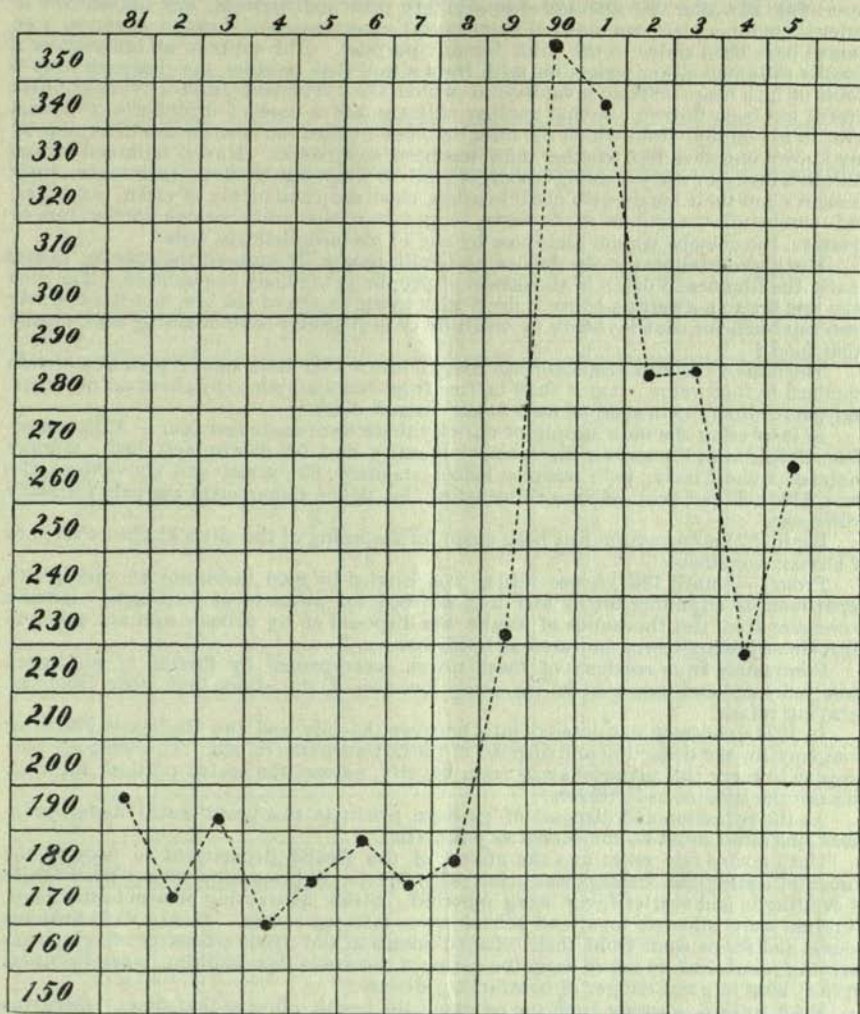


This chart, on the same plan as the diphtheria chart, shows the result of what in many cases is a preventable disease and for which almost nothing is done by our sanitary authorities. The average number of deaths during the past fifteen years have been more than 300 per year. Varying each year with different conditions, especially the prevalence of catarrhs, diseases of the lungs—bronchitis—pneumonia—the increase of population, bad sanitation, and deaths from consumption have been more or less numerous.

The relation that may exist between unwholesome milk and the production of specific diseases is frequently mentioned in the public press. During the past year a number of epidemics of specific diseases have been traced with scientific accuracy to milk as a cause. In a paper read at Washington, D. C., by Dr. S. C. Bussey and Dr. G. M. Kober, tables were given of 134 epidemics of typhoid fever, 27 of diphtheria and 73 of scarlet fever, directly traced to contaminated milk. These epidemics involved thousands of cases and many deaths. Milk has long been known as a prime factor in the propagation of various diseases, but in no municipality of this country has adequate means been taken for the protection of its citizens against disease and death that may lurk in the milk pail.

In Rochester about 356 licensed milk dealers daily distribute more than 60,000 quarts of milk received from the city and a radius of 50 miles. To supervise this most important food supply but two men are employed; these are, by legislative enactment, required to work together in securing samples of milk for examination. If a sample of milk should be found on analysis below the standard prescribed by law, the milk inspector would testify to the facts and his assistant must be able to swear that the

BRONCHITIS AND PNEUMONIA DEATHS FOR FIFTEEN YEARS.



From 1881 until 1888, the number of deaths from bronchitis and pneumonia was small. In 1889 there was a sharp rise which continued and reached its acme in 1890. A very slight fall in the mortality was observable in 1891; in 1892-93 the fall was considerable; in 1894, the fall continued; in 1895, there was an increase of 40 deaths. The increase in mortality in 1889 was coincident with and principally dependent upon the outbreak of epidemic la grippe in the autumn of that year. This increase continued as long as la grippe remained epidemic. As la grippe diminished the mortality from bronchitis and pneumonia diminished considerably, the slight rise in mortality from these diseases being undoubtedly due to the city's growth.

The effect of la grippe upon the mortality from consumption is interesting. The increased number of deaths from consumption did not begin until la grippe had nearly passed away. Either many deaths from consumption were reported as deaths from la grippe in the beginning, or la grippe operated to lower the bodily resistance and thus render the respiratory tracts of those persons who contracted it more liable to consumptive disease.

questionable sample was obtained from the milkman prosecuted. But the milk inspector who is a practical chemist can only from the very nature of his calling work along lines that are essentially chemical. He can examine milk for the quantity of cream or percentage of butter, the amount of total solids, principally casein, and the amount of water it contains. He can also tell by chemical examination if foreign chemical substances have been added to the milk for any purpose. But suppose an ignorant or a rascally milkman either waters his milk from a well that receives the drainage from a stable or filth heap or from a vault into which the excrement from a typhoid fever patient has been thrown; or that another milkman has a case of diphtheria or scarlet fever in his family, from which the milk becomes infected, no chemist can determine by any known chemical test whether milk has been so infected. Now if milkmen expose milk in a dusty or dirty cooling room, or fail to thoroughly clean their cans, their measures and their hands with clean brushes, clean soap and plenty of clean, hot water, and thereby allow myriads of bacteria to get into the milk, adhere to the pail or measure, the chemist cannot find these by any of his most delicate tests:

Much uncleanness in the dairies and milk-rooms throughout the country causes yearly the illness and death of thousands of people, yet nobody is punished. The man who sets fire to a dwelling-house is dealt with to the extent of the law, but has one ever been punished for causing death by willfully or negligently contaminating milk or any other food?

The aim of the milk inspector has been to insure that milk shall represent a certain standard in food value; that it shall be free from contaminations by chemical products, and that ordinary care shall be used in stables and dairies.

In inspecting the milk supply of our city there were made last year: Milk inspections, 2023; samples examined, specific quantity and fat determined, 1349; samples analyzed quantitatively, 103; samples below standard, 65; arrest and convictions, 29; fines, \$725; 26 per cent. of fines collected by the police department has paid for many ordinances.

Until 1870 no provision had been made for disposing of the city's kitchen waste nor of human excrement.

From — until 1894, house refuse was carried by men in employ of the Health department to adjoining towns and used as food for swine or as fertilizers. Human excrement from the thousands of vaults was disposed of by private contract, taken to farms in adjoining towns and used as fertilizers.

Complaints from residents of these towns accompanied by threats of suit began some years ago and increased in frequency because of the odors that arose from the decaying refuse.

In 1894 a contract was entered into between the city and the Rochester Fertilizer Company for the collection and disposal of the city's organic refuse. The company now propose to carry this material away from the city, extract the useful portion, fat, etc., and use the balance as fertilizers.

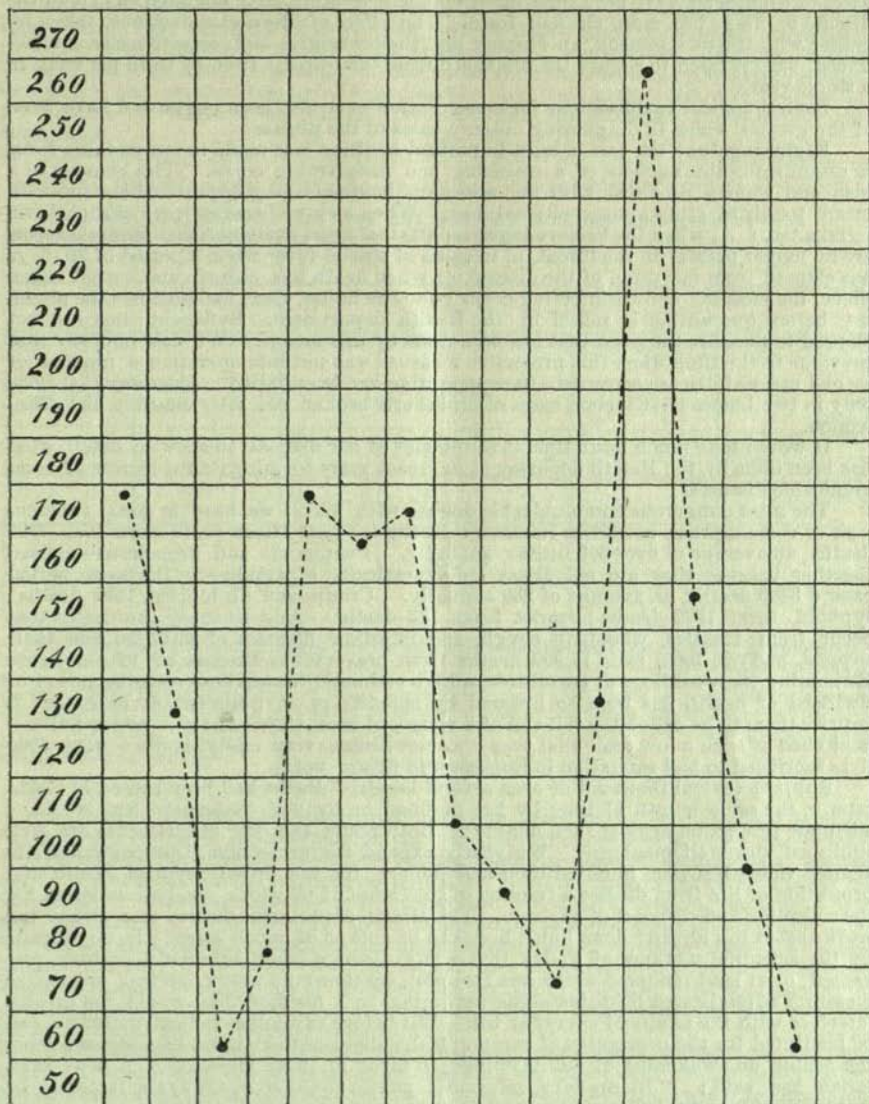
As the reduction and disposal of garbage products at a profit is still under judgment, the effort must be considered as but a trial.

Until a very few years ago the efforts of the Health department to prevent the spread of contagious diseases was principally directed to placarding houses where cases of diphtheria and scarlet fever were reported. Strict quarantine was not attempted. Children were allowed to attend school from infected homes. Workmen in business houses and shops went from their infected homes to and from places of employment carrying, doubtless, in many cases the germs of disease in their clothing, whereby others were at least in great danger of contracting disease.

Prior to 1888, quoting from the report of the health officer at that time, "there was no record of dangerous nuisances, no history of contagious diseases." As there is no trustworthy history of contagious diseases until 1892 we may take in comparison the deaths from diphtheria, scarlet fever and typhoid fever for the estimated or actual population for 15 years and see what a remarkable decrease there has been, especially in the diphtheria rate, during the past two years. Taking diphtheria as one of the most dangerous acute diseases, from which so many die and so many others recover, mere wrecks of their former selves, what health reforms have been wrought to bring about this decrease in the number of cases and deaths. First, there has been an attempt to more nearly approach a system of actual quarantine; children have not been allowed to attend school from infected houses; the milk supply has been closely watched so that in no case has it been possible for a contagious disease to spread extensively from such a source. Public funerals have been prevented in cases of diphtheria and scarlet fever; the sanitary conditions, plumbing, and drainage, of infected dwellings have received

DYPHTHERIA DEATHS FOR FIFTEEN YEARS.

1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895



This chart is constructed on the same general principle as the chart showing the annual death rate from all causes. It differs only in that it deals with the actual number of deaths from a given disease in each year instead of the number of deaths per thousand. In 1881 the number of deaths from diphtheria in a population of 90,000 was 178. In 1883, in a population of 95,000, it fell to 61. In 1892, with a population of 135,000, the deaths rose to the enormous number of 268. From thence there has been a steady decrease in the number of deaths, until in 1895, with a population of 160,000, there were 61 deaths, a smaller number of deaths from this disease than in any year but 1883, when the city had only two-thirds of its present population.

needed attention ; and lastly, the period of quarantine in diphtheria has been extended from an arbitrary period of fourteen days to a period determined by the absence of disease-producing germs from the patient's throat. These bacteriological examinations for diphtheria were begun in November, 1894. By their means a large number of mild cases of diphtheria have been discovered which heretofore have operated to extend the disease to others in a more virulent form. The effect of these examinations, taken together with the new remedy, anti-toxine, and the preventive and protective means introduced, has operated to reduce the mortality from this disease from 36 to 16 per cent. in a single year.

Bacteriological examinations for consumption have also been begun and have been of the greatest value in diagnosing obscure cases of the disease.

Beginning June 1st, last, a most important addition was made to our working force in establishing the nucleus of a cleansing and disinfecting corps. This consists of a man and woman provided with the necessary house-cleaning appurtenances and with means for disinfecting houses with sulphur. When a case of scarlet fever or diphtheria terminates, *i. e.*, when the bacteriologist reports that upon examination diphtheria germs are no longer present in the throat, or in cases of scarlet fever when a period of 30 days has elapsed from inception of the disease, or when death has ensued and burial taken place, the cleaning and disinfecting corps go to the house, clean and disinfect the premises before quarantine is raised by the Health department. Sufficient time has not elapsed to measure the good that has been done by this means. We can only say that previous to the time when this protective measure was put into operation a number of second cases of disease occurred after quarantine had been raised. Since June 1st 1895, only in two homes have second cases of diphtheria broken out after cleaning and disinfection.

It would take much more time than remains at our disposal to show in detail what has been done by the Health department in recent years to mitigate the terrors of communicable diseases.

The most dangerous communicable disease with which we have to deal, tuberculosis or consumption, caused in Rochester during the past fifteen years more than 4500 deaths, an average of over 300 deaths annually. Pneumonia and bronchitis—classed together because they are not always diagnostically separable—in the same period caused 3400 deaths, an average of 230 annually. Croup and diphtheria, 1962 deaths ; typhoid fever 1962 deaths ; scarlet fever 123 deaths. Add to these the deaths that occur from measles, whooping cough, and intestinal diseases of children and their sequels, and we have over 15,000 deaths from preventable diseases in fifteen years. Estimating the weaklings at two-thirds, a high estimate, those whose resisting power or standard of health has been so lowered by heredity or environment or both, that it entitles them to be called the tail end of a worn-out race, those whose "power to live" is pitched at such a low scale that they contract disease very easily, and we have 5000 lives sacrificed to bad sanitation in Rochester in fifteen years.

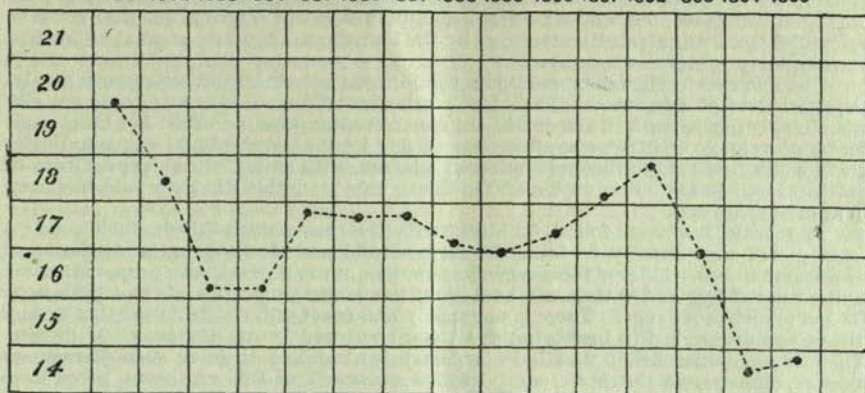
Suppose several thousand or even several hundred deaths had been caused in Rochester in the same length of time by fire or flood or by mob violence. But we have adequate protection against such dangers. Both police and fire departments are well equipped and well managed. We yearly expend for protection of property and life against violence several hundred thousand dollars, for the preservation of health and protection of life from disease a fraction of that amount of which one-half is spent for the collection and disposal of garbage. The Health department desires to continue the work that it has already done but it hopes to be able to do much more. It is believed by the scientific workers of to-day that many diseases could be almost entirely prevented, or at least rendered much less frequent, by thorough protective and preventive measures administered by painstaking sanitarians in a manner that would not greatly interfere with the affairs of everyday life. But before any more radical measures can be instituted for the prevention of communicable diseases there must be a demand from the people, an awakening of public opinion in favor of these measures. A wise sanitarian has said : "In sanitary reforms a public opinion is always a factor to be reckoned with and this is slow to move."

Public opinion in favor of further sanitary measures for the promotion of health and prevention of disease cannot come to be thoroughly and universally in accord with advanced sanitary ideas until certain educational reforms have been begun. When learning by rote shall be banished and the child treated as a thinking entity instead of a machine into which book-learning is to be dumped ; when the elements of biological sciences, including physiology, shall be taught in the schools, not as intended by the Ainsworth law, but by laboratory methods ; when elementary hygiene shall be a part

of the curriculum in every school and shall be demonstrated by necessary apparatus ; when the school buildings shall be monuments of sanitary advance, when in high-schools and finishing-schools the young woman shall be taught the functions peculiar to her sex and the knowledge of those things she ought to know about maternity and the maternal functions ; when, in short, every child in the schools may be taught a knowledge of right living, the necessity for pure air and sunlight, good food, sleep, sanitarily habitable homes and the functions of the human body ; when these things are taught by teachers with special training for the work, then can we hope for higher health, longer life, and greater freedom from disease. By such means, too, will the highest possibilities of physical and mental manhood and womanhood be attained in our civilization.

ANNUAL DEATH RATE PER 1000 FROM ALL CAUSES FOR FIFTEEN YEARS.

1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895



*This chart shows the annual death rate per thousand inhabitants for fifteen years. The horizontal column of figures represents the years from 1881 to 1895; the perpendicular column the number of deaths per thousand. Each line stops at or near a horizontal line and shows the number of deaths and fraction thereof that occurred in each year. According to the United States census in 1882 the city had a population of 90,000, in 1890 a population of 134,000, in 1895 an estimated population of 160,000. In 1881, with less than two-thirds the present population, there were 20.04 in each thousand of the population, while in 1894 and 1895, with a population of 150,000 and 160,000, the deaths were 14.54 and 14.68 per thousand respectively.

As Herbert Spencer wrote more than thirty-one years ago : " If by some strange chance not a vestige of us descended to the remote future save a pile our school-books or some college examination papers, we may imagine how puzzled an antiquary of the period would be on finding in them no indication that the learners were ever likely to be parents. ' This must have been the curriculum for their celibates,' we may fancy him concluding, ' I perceive here an elaborate preparation for many things ; especially for reading the books of extinct nations (from which indeed it seems clear that these people had very little worth reading in their own tongue) ; but I find no reference whatever to the bringing up of children. They could not have been so absurd as to omit all training for this gravest of all responsibilities. Evidently then, this was the school course of one of their monastic orders. '"

We do not, at the end of the nineteenth century, pay enough attention to the promotion of health and the prevention of diseases ; we rather seek to cure people after diseases have attacked them. Almost every one is in some way interested in charitable societies or institutions for the care of the sick. Many visit hospitals or are members of hospital boards of managers, but how many ever thought of doing anything to prevent these hospitals from filling their wards and rooms with sick.

Why not then, in addition to the labor of hospital work, become interested in an institution that strives to prevent people from becoming sick ? If not interested in a

*The charts were prepared by Mr. F. D. Sedgwick, Inspector for Diphtheria, Rochester Health Department.

humanitarian sense, become interested in a selfish sense, for every case of communicable disease prevented means a greater measure of protection offered to every home in Rochester. In a strictly commercial sense the value of saving annually even a few hundred lives is considerable. Not only are the lives themselves of some importance, not only have they a value, but the standing of our city as a residence center would be thereby increased and the welfare of the city enhanced.

Our Chamber of Commerce strives in every way to promote the commercial importance of our city. Might it not do something to increase its sanitary importance? It has committees empowered with various duties, but I never have heard of a sanitary committee whose duty should be to see that our health laws are good and well enforced, to determine that sanitary conditions are maintained in schools, factories and workshops, and that adequate measures are taken for the suppression of communicable diseases. In New York, Chicago, and other cities organizations similar to our Chamber of Commerce have lent aid in time and money when their city has been threatened by an invasion of cholera or small-pox. The aid given by these bodies of men has undoubtedly saved many lives and much loss of money, but the aid was given to prevent a foe coming from a distance, one whose natural habitat is not in our country, one that could be prevented from waging death among us by the immediate adoption, at great expense of extraordinary preventive measures.

The invasion of cholera or small-pox would mean industrial and commercial paralysis, much loss of life, loss of time, and great expenditure of money; yet in our city when nearly one-seventh of the deaths are due to consumption no effort has been made for its prevention. If the same efforts were made for the prevention of consumption as are now directed toward the prevention of cholera, with an additional expenditure of not to exceed \$1000, a diminution of the death rate from this disease would be shown in at most two years.

A remedy has been found for diphtheria that has accomplished much good; a remedy will undoubtedly be found for certain mild and slowly-progressing forms of consumption, but whatever these remedies are they must be used with proper attention to the rules of hygiene or they will be failures in a larger proportion of cases. We hope for too much from drugs. There is no remedy and never will one be found that in any disease can restore bodily health to the standard enjoyed before the outset of disease. There is a popular belief that it is necessary for children to have such diseases as measles, mumps, scarlet fever, etc. Parents possessed of this erroneous belief have knowingly exposed their children to these and other diseases, to the great danger of health and life. If it were generally known that a very large percentage of all cases of deafness can be traced to measles and scarlet fever, and that a large number of cases of catarrh and other disturbances of the respiratory tract have their origin in such diseases, that even chicken-pox, while not attended by death, may seriously weaken a child's health, I believe that exposure would be less frequent.

We say we are made well of a disease, but any attack of illness leaves a lasting impression upon the body and no doubt tends to weaken the powers of resistance and in the end to shorten life. Still, we rather leave prevention to chance and call on "luck or fortune," some charm or ring. The cry is for a cure from him "who would not give an atom to prevent what he would give ten thousand worlds to cure."

This talk would be most incomplete were not some suggestion offered for the further reformation of our municipal and individual sanitary affairs. Thus far the Health department has done about all that can be done until a decided demand from the public openly comes to its aid and asks that it do more. The past years of its work are before the people; its results show whether it has done well or ill. It does not ask much money nor praise, only support from the people in whose interests it has labored for small thanks and much open abuse. Some of the reforms that are suggested are the following:

First—The closer sanitary supervision of our public and private schools. As recommended in a report nearly two years ago, no new school house to be erected until a sanitary engineer or other competent authority has passed upon (a) the system of ventilation; (b) the heating and lighting; (c) the plumbing and drainage. In all present school-houses a plan of sanitary conduct, including ventilation to be prescribed for each school by a medical officer of the Health department, one of whose duties it shall be to see that copies of the plan be served upon every principal, and who, together with the superintendent of public instruction, shall be held responsible for the enforcement of the plan prescribed in each case. So many of our school-houses were built without adequate supply of fresh air that enforced provision for good ventilation is of the greatest importance. The New York health board estimates that 40 per cent. of all deaths in that city are due to breathing impure air.

Second—The drafting of rules to govern janitors in cleaning and warming the various school buildings. In some of our school buildings it is customary for the janitors to begin sweeping before all the pupils have been dismissed. That is, when the primary grades have gone home, sweeping is begun in the rooms just vacated by them. In cold weather the windows are not opened and the dust rises in all parts of the buildings, to be inhaled by the remaining pupils and teachers. As the dust arises it carries with it countless thousands of bacteria, some of them doubtless the bacteria of specific diseases, most of them not; but whether the bacteria in dust contains many of the germs of specific diseases or not, the dust and non-specific germs of decomposition and putrefaction cause, when inhaled, catarrhs and other disturbances of the breathing apparatus that lower bodily resistance and make all who breathe such air for several hours a day more susceptible to disease. Similar sanitary supervision should extend to factories, shops, public buildings and churches.

As an argument in favor of thorough cleaning in our school buildings by prescribed sanitary methods, allow me to call attention to an extract from the report of the chairman of common-school hygiene of the National Educational association:

"The death rate per 1000 living at the age period 5-15, which is the healthiest decade of life among civilized men, is less in London than in Brooklyn, Philadelphia, New York, Washington and Baltimore, or in Boston, whose death rate is higher than in any of the cities named, while Berlin has a lower death rate than any of these cities, except Washington and Baltimore. The mortality from diphtheria among children of school age—and from consumption among female school teachers—is markedly greater in Boston than in any other of the American cities named above. No class of wage-earners in Boston, so far as the mortality rates, analyzed by occupation, of the United States census bureau go, has so high a death rate from consumption as women school teachers, excepting marble and stone cutters. The fact that Boston is the only one of these six cities which habitually neglects to wash her school house floors and corridors from year to year and decade to decade is not without significance.

"It can not be denied that municipal sanitation and school hygiene are more highly organized and successfully administered in the leading cities of Europe than in the leading cities of America. Indeed, school hygiene has no place of standing among the arts and sciences in America. There appears to be no department of public health so miserably endowed, so incompletely organized, or so well nigh universally neglected by publicists, scientists and publishers of school hygiene. Without resort to foreign books, periodicals and official reports, it is quite impossible for the student to inform himself as to the nature and results of the investigations and experiments made during the recent years for the improvement of the health of the school population on the continent of Europe.

"If the public health is to be effectually guarded, the schools and those that frequent them should be subject to the inspection by properly-trained representatives of the board of public health, which board should have a voice in the selection of school sites, and in the matters relating to the drainage, plumbing, heating, lighting and ventilation of school-houses. Ordinary physicians and teachers are not competent, as a rule, to pass intelligently upon questions of sanitary engineering which naturally arise in connection with the planning, erecting and furnishing of school-houses."

Third—The removal of drinking-cups from the hall sinks and the substitution of separate drinking-cups for every child or the introduction of a sanitary drinking device into the class rooms. Two years ago an epidemic of diphtheria involving thirty-two cases and several deaths among school children, was directly traced to the hall drinking-cups in one of our schools. Diphtheria bacteria were grown from the rim of the cup used by these children. The public drinking cup in schools and elsewhere has long been known as a source of danger in communicating diseases from one to another. Health officers in other cities are alive to this danger but almost nothing has been done to prevent it save in New York, within the last six months, because fathers and mothers are absolutely indifferent to the dangers arising from such sources. In New York city all the hall drinking-cups have been recently removed by the health department, and until some better plan is devised water pitchers and glasses have been placed in every school-room in the city.

Fourth—The appointment of teachers in our schools who shall have had sufficient training in elementary biological science by the laboratory method and in practical sanitation, including personal and municipal hygiene, to enable them to teach by the laboratory method the elements of human physiology, the promotion of health, and the prevention of communicable disease.

Such teaching should include: the value of pure air in inhabited buildings; pure

water ; the selection and preparation of good food ; cleanliness within and without the body ; the best and most economical methods of heating and lighting dwellings ; clothing, its use and abuse ; and the simplest means of preventing communicable diseases.

Fifth—As a small but no less important beginning there should be an attempt to prevent consumption by cleaning and disinfecting those houses in which consumptives have died, and by drafting and enforcing an ordinance requiring all cases of consumption to be reported at the health office so that pamphlets embodying simple necessary preventive measures could be sent to the afflicted families. If but the cleaning and disinfecting of houses where consumptives have died could be thoroughly carried out a decrease in the number of cases of consumption would be very soon apparent. This would not only be saved by preventing the extension of the disease to other members of the family, but many lives would be saved in other families among the poorer classes. For a long time it has been noticed that a family living in a rented house when losing a member by death, soon after the funeral moves from the house into some other dwelling, leaving the infected house for some other family to move in while the family moving carries with it infected clothing, bedding and furniture into some other house. Consumption is often spread in this way. Cleaning and disinfecting would do much to prevent it.

Sixth—A campaign of sanitary education should be begun similar to that introduced by Dr. Henry B. Baker, of the Michigan State Board of Health, and other sanitary officials. As in diphtheria and consumption, so in typhoid fever, scarlet fever, measles, whooping cough, pneumonia, syphilis and the intestinal diseases of children, pamphlets printed in two or three languages should be issued by the Health department for distribution among the people, showing the simple modes of prevention and protection in these diseases.

The reforms we hope to make are few, simple, and easily executed. We do not seek as yet a sanitary Utopia. We only desire to work along the lines of nineteenth century progress for the promotion of health, the prevention of disease and to aid in teaching that "life is not to live but to be well."



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