Thornton, (G. B.)

Compliments of

The Author

The Present Improved Sanitary Condition of Memphis,

BY

G. B. THORNTON, M. D.,

MEMPHIS, TENN.

PRESIDENT MEMPHIS BOARD OF HEALTH.

Delivered at the Fifty-fourth Annual Meeting of the Medical Society of the State of Tennessee, held at Nashville, April 12-13, 1887.

HASSLOCK & AMBROSE, PRINTERS, NASHVILLE.

THE PRESENT IMPROVED SANITARY CONDITION OF MEMPHIS.

BY G. B. THORNTON, M.D., MEMPHIS, TENN.,
President Memphis Board of Health.

THE above caption being assigned me as a subject for a paper to be presented at this meeting of the Society, I will reproduce a part of an essay prepared by myself on "Six Years' Sanitary Work in Memphis," and read before American Public Health Association at its fifteenth annual meeting held in Toronto, Canada, in October, 1886, with such additions and changes as are thought applicable to the present occasion.

No city in the State, and few, if any, in the United States, has attracted more attention from a sanitary point of view, or suffered more from epidemic diseases than Memphis. Nashville and other places in Tennessee have been severely visited by cholera and small-pox, but it was at a time when public attention was not so pointedly directed to them, and they did not suffer in their business and commercial interest to the extent that Memphis did from its epidemics of yellow fever. Though Memphis has been the subject of cholera and small-pox when they prevailed in the country, and to a limited extent from the zymotic diseases, such as scarlet fever, diphtheria, measles, etc., common to all other towns, they have never prevailed to the extent to materially injure the city in its business or social relations. Its geographical location—in the extreme southwestern part of the State—and its constant commercial intercourse with the cities of the Gulf coast rendered it more exposed to the introduction of yellow fever from that section, when the disease prevailed there, than any other point in the State. Owing to the extent of the sanitary work done and the precautions against the introduction of exotic diseases since 1879, there are substantial reasons for entertaining the belief that the city will never again be the subject of serious epidemic of any character.

It has been demonstrated that the city can be protected by proper precautions against the introduction and spread of infectious diseases by well-directed efforts of a local health service, and the death-rate lowered from the endemic diseases.

The folllowing extract is taken from the essay above alluded to, treating of the sanitary history of Memphis, and applicable to the present thesis:

"Before discussing its local sanitation and inland quarantine after it grew to be a city, it is well to go back to a period prior to epidemics, and direct attention to some of the natural conditions that from the first were against health and life. The topography of the ground upon which the city was built, and a want of sanitary precautions as it grew from an unimportant river village to an important commercial center, is an interesting study in this connection, and plays an important part in those factors which maintained a high death-rate from endemic diseases, and facilitated the spread of exotic diseases when introduced at seasons of the year favorable to their spread. The high bluff upon which the city stands affords many natural advantages over the surrounding country and other localities of the Mississippi Valley; and these advantages alone were too much relied on for preservation of the public health. With the experience of the past, and aided by the light of sanitary science, it is instructive to follow the growth of this city, and note the changes in grading high places, filling up depressions, diverting natural water courses, together with accumulations of filth and waste, incidental to population, thoughtlessly left to pollute the soil, contaminate the drinking water, and add evil influences to natural unsanitary conditions. To correct these evils, both natural and the result of ignorance and negligence, is the work of the sanitarian, that requires time and money as well as the education of a community out of its primal prejudices. The site of Memphis on the fourth Chickasaw bluff, near where Wolf River empties into the Mississippi, in latitude 35.08, 315 feet above sea level, is naturally one, notwithstanding abrupt elevations and deep depressions, requiring the skill of the engineer to prepare it for habitations.

Bayou Gayoso, rising in the southern suburbs of the city, runs in a northwesterly direction, nearly through its geographical center, and empties into Wolf River. This bayou and its branches afford the natural drainage for nearly the whole city, and a large area of country east and south of it. It may be described as a deep, crooked ravine, widening near its mouth, having a fall of some ninety feet in four miles, through which in periods of heavy rains the water rushes in great volume, while in the intermission of rainfall it shrinks to the proportions of a rivulet, excepting in the spring when its banks are filled by the back-water of the Mississippi River almost to the heart of the city. It

has always been an important factor in considering the question of local sanitation.

Memphis of to-day presents very few of the features characterizing its early life. The grading of its streets, filling of low, wet places, and the changing or obliterating of many small water-courses has so altered its physical appearance that the visitor now would scarcely recognize its topography of fifty years ago. The site was first surveyed for a town in 1819. At first the growth was slow; by United States census of 1830 its population was 663; of 1850, twenty years after, 8,841; 2,480 of which were colored. During these years cases of cholera, yellow fever, small-pox and other infectious diseases occurred, but there is no authentic record of any epidemic from either. The growth of the city from this date was more rapid, but very little attention was paid to measures looking to the preservation of the public health. Cases of yellow fever are known to have been taken from boats from New Orleans and died in the city and city hospital, from which there was no spread, or at least none to attract special attention, though no precautions were taken to prevent infection. The earliest official records now obtainable, if there were ever any of the presence of either yellow fever or cholera, are in 1851, which shows ninety-three deaths from cholera. Both diseases are known to have been in the city previous to this period, but there exists no authentic record of the number of cases or deaths from either. There are, however, official records of deaths from yellow fever and cholera in 1852–53–54 and 1855. From 1856 to the close of the civil war in 1865 there are no records. In 1866 an official register for part of the year only shows a total number of deaths from cholera of 402, which is incorrect and falls short of the actual number.

In 1867 cholera and yellow fever both prevailed. The official register shows 259 deaths from yellow fever; the first case officially reported in September, and the last in December. The disease this year was not general, but was confined to certain districts. Boards of Health up to this time, when organized, were nothing more than advisory bodies, whose advice when given was not followed, their functions and utility not being properly appreciated. They were organized for emergencies, and generally suspended with the disappearance of danger. All attempts toward local sanitation, and all restrictive measures were of a spasmodic character, being brought into requisition by the presence of epidemic disease for immediate relief, or to allay panic, and for the time, satisfy a public sentiment.

In 1873 yellow fever was officially announced in Memphis, September 14, though a number of deaths had occurred from the disease previous to that date which were not recognized as such, there being a diversity of opinion among the physicians as to its true character. The last case officially reported was in November. The official record shows, 1,244 deaths.*

It would seem, with the experience of these several visitations of yellow fever and cholera, the authorities and people of Memphis would have acquired sufficient wisdom to guard against a repetition of epidemic from either in the future.

The great yellow fever epidemic of 1878, which was general over the southwest, taught Memphis its severest lesson, and marked an epoch in the sanitary history of this country. The population of the city then was estimated at 55,000. The first case was officially recognized in the city hospital August 2. This case was that of a man taken from a New Orleans steamboat, who remained in the city two days prior to his admission into the hospital. On August 3 he was removed by the health officer to the quarantine station, eight miles below the city, on President's Island (Mississippi River) where he died. The first case reported by the Board of Health among the citizens was on August 13, the last death December 10 (a returned refugee) but it is evident that deaths occurred in the city between August 1 and 13 and perhaps earlier, but as usual the disease was not recognized, and consequently deaths were reported as from other causes. This, too, may have been the case in some instances during the progress of the epidemic, and *vice versa.* The official register at the health office shows number of deaths from yellow fever 2,779 in the corporation. The death register of the Howard Association shows 4,713 deaths, and gives name, date and locality. It includes city and suburbs, and the country adjacent to which they had sent their physicians and nurses. In addition to this, it also furnishes a separate list of 109 names of refugee citizens in whom the disease was developed after leaving the city, and who died elsewhere, making a total of 5,022.† This epidemic,

* For an account of this epidemic see report of U. S. Marine Hospital Service for 1873.

† See History of the Yellow Fever Epidemic, 1878, by J. M. Keating, Memphis. Published by Howard Association. In this connection the following foot note to page 116 is herewith added as germain to this subject, though the number of deaths, 5,150, differs from above text:

"The medical estimate (Howard Association Medical Corps) puts the total

which extended over such a vast area and involved such a number of places, so aroused the country to the importance of preventive measures that a new impetus was given to the study and application of sanitary science, and this state of public feeling led to the organization of the National Board of Health and many State and local boards.

The epidemic of 1878 in this city beggers description, and is only briefly alluded to here since it attracted such wide attention, and was the cause of special legislation, both State and National, and led to the great reforms which have reclaimed Memphis and demonstrated what a community can do by well directed energy aided by science, in face of adverse circumstances. On its subsidence the city was literally paralyzed, besides being in a worse sanitary condition than ever before. A demoralization seemed to pervade the whole community, and a general distrust in the city government to administer its affairs to the best interest of the people was universally felt The winter passed without an effort being made, worthy of mention, by the authorities toward sanitary work. The city being bankrupt and largely in debt, without credit at home or abroad, could do nothing. Moreover there was a want of appreciation of the true state of affairs. All prominent citizens agreed that something should be done, but in view of the condition of the city's business and the general demoralization, it was difficult to determine specifically the best course. The plan finally adopted, while novel and radical, met with strong opposition at first, but proved in the end the wisest.

On petition of the citizens of Memphis the State Legislature, which met that winter, took away the charter of the city, and passed a law putting the local government into the hands of seven commissioners, authorized to administer the affairs of the city *as a part of the body of the State*, called the taxing district of Shelby County. This Commission designated the Legislative Council, was at first appointed by the Governor, and subsequently elected by the people. (For detail of this law see Acts of the General Assembly of Tennessee, 1878–79). The

---

population, during the epidemic, at 19,600, and the total sick at 17,600, the deaths as stated being 5,150, a little less than one-third. Members of the Howard Visiting Corps, who have resided in the city many years and know it well, and whose business during the epidemic, it was to visit every ward every day, say that at no time was there more than 20,000 persons in the city, if so many, and that of these fully 14,000 were negroes, leaving only 6,000 white people. Of the 14,000 negroes 946 died of the fever, and of the 6,000 whites 4,204 died, being 70 per cent. of the whole number. Not more than 200 white people escaped the fever, and most of these had been victims of it in previous epidemics."

new government commenced the work of reorganization and reformation in February, 1879, with an empty treasury, a disheartened community, and the constitutionality of the law creating it, yet to be settled by the Supreme Court of the State. Among other things this law created a Board of Health, and defined its duties and jurisdiction. It provided that there should be elected annually by the Legislative Council a President who should be a physician of at least five years' residence, with power to appoint a Secretary who had graduated in medicine, a health officer invested with police powers, and the chief of police, member *ex-officio*, all to give an official bond for the faithful discharge of duty. The President of the Legislative Council, who corresponds to Mayor, was also made a member *ex-officio* of this Board. The health ordinances were revised, added to, and changed to apply to the new order of things.

The first practical step toward local sanitation, after organization, was to remove from the public thoroughfares and private premises the accumulations of the past six months of garbage, waste, and refuse of every conceivable character incident to population. The health ordinances were enforced as rigidly as practicable, both in regard to private property and public places. A corps of sanitary police, who reported directly to the Board of Health, made daily inspections and brought delinquents before the police court. It is but just to say that the majority of individuals responded cheerfully to the requirements, being impressed with the necessity for such work, while others exhibited an indifference amounting to opposition. A public garbage service, with all necessary appliances, was organized, and has been since operated under the immediate supervision of the health officer. In this early work the authorities were assisted by an organization of citizens, known as the Auxiliary Sanitary Association, which was maintained by voluntary contributions, and co-operated with the health authorities, aiding with their means and moral support.

Yellow fever reappeared in July, 1879, and its management which followed, demonstrated the fact that a city the size of Memphis may be the subject of infectious disease without the infection extending to other communities. On its outbreak the population was estimated at 40,000. By July 28, by voluntary and forced depopulation, it was reduced to 16,110, of which 4,283 were white, and 11,827 colored, and it is estimated that of the total number 5,645 were not protected by previous attack. The first case was reported July 8, the last November 15; number of cases reported 1,532: white, 853;

colored, 679. Total number of deaths, 485; white, 379; colored, 106.

From the commencement to the close of this epidemic, the National and State Boards of Health co-operated with the local authorities.*

In December following, by invitation of the authorities, the National Board of Health commenced a thorough house to house inspection and sanitary survey of the city, with the view of indicating what was specifically necessary to be done in order to place the city in proper sanitary condition. The commission assigned to this duty, furnished the local health authorities schedules of nuisances as the work progressed.†

The main points indicated may be briefly stated to be :

1. A complete system of sewerage and subsoil drainage embracing the whole city.

2. The emptying, disinfecting, and filling with fresh earth all privy vaults, and substituting of earth closets or water closets in their stead when sewer connections could be made.

3. A thorough cleansing of cellars and premises.

4. Removal of the wooden block Nicholson street pavements (of which there were nine miles mostly in a decayed condition), and replacing them with some character of stone.

5. The destruction or renovation of all unsanitary houses, and the prevention of the erection of others, either for business or residence purposes, without a permit from the engineer's office prescribing certain sanitary rules.

6. A discontinuance of cisterns and wells containing impure water.

7. The improvement of the public water supply.

8. A treatment of Bayou Gayoso and its branches.

9. The perfecting and maintainance of a public health service, involving the removal of house waste and refuse.‡

---

* For detailed accounts of this epidemic, see National Bulletin of Health, vol. 1, page 85, current number for August 9, 1879. First report of Tennessee State Board of Health, 1877–80. Essays on this epidemic, vol. 5. Published Reports of the A. P. H. A.

† For details of this inspection see reports of the National Board of Health.

‡ For an interesting report on the sanitary condition of Memphis, and the recommendations for necessary reforms by a commission appointed by the National Board of Health, composed of Dr. J. S. Billings, U. S. A., Vice-President N. B. of H.; Dr. R. W. Mitchell, member; Maj. W. H. H. Benyaurd, U. S. Engineer; Geo. E. Waring, Jr., C. E.; Dr. Chas. F. Folsom, Sect. Mass. State Board of Health,

This work has steadily advanced since its commencement, and the health service enlarged each year as the growth of the city demanded and its revenues justified. The average annual current expense for six years in maintaining the health service, exclusive of sewer construction or repairs, which belongs to the engineer's department, is $22,726.68, as shown by the annual reports of the Board of Health, to which reference is made for detailed information of expense and work done.

Sewers.—As much interest has been manifested in regard to the Memphis sewers, which are comparatively new, a brief technical description is given, with their cost and expense of maintainance to date.

The main sewers are located on each side of the bayou as near to it as practicable, which discharge by one main conduit. The mains are ten, twelve, fifteen, and twenty inches in diameter. Of the laterals about 85 per cent. are six inches in diameter and the remaining eight inches, except a few short lengths which are ten inches. The mains, for the most part, are laid with a grade of two inches in one hundred feet, which is the minimum. The minimum grade of six inch laterals is six inches in one hundred feet. At the upper end of each lateral is located one of Roger Field's automatic flush tanks, which discharges one hundred and twelve gallons of water in about forty seconds. It discharges as soon as filled, but it is believed once in twenty-four hours is sufficient. Each tank cost, complete, about $45, including $10 royalty. The mains are provided with manholes and the laterals with observation openings. No surface water is permitted to enter the sewers, the system being designed and proportioned for house sewage only. The house connections are four inches in diameter, and no trap is permitted on the main drain, each fixture being provided with a separate trap. The soil pipes to closets are four inch cast iron, with lead joints above the ground and extend four inches above the roof. Each house drain is consequently a ventilator for the public sewer. No trouble has been caused by sewer gas, and the sewers are believed to be comparatively free from it, the constant flushing preventing de-

---

see vol. 1, page 187 National Bulletin of Health, current number for December 13, 1879.

‡See also for a "Summary Sanitary History of Memphis, Tenn., based upon a house to house inspection of the city, November 24, 1879, to January 3, 1880, made under direction of National Board of Health." Report of Dr. F. W. Reilly. See supplement No. 3, vol. 1 National Bulletin of Health, 1880.

composition and its formation. Occasionally the six inch laterals have been obstructed by sticks, bones or some substance not intended to pass through them, which are removed at an average cost of $10 each as seen by accompanying table. Occasional deposits of silt or paper are found in the mains which are easily and inexpensively removed by the passage of hollow metal balls through them. These balls are about three inches less in diameter than the sewers, and being lighter than water are pressed against the top of the sewer and are rolled along by the force of the current. The velocity of the ball is less than that of the water, which, in passing, is deflected against the bottom and sides of the sewer so as to thoroughly cleanse it. For the purpose of removing the subsoil water, agricultural drain tiles are laid in the trench with each lateral on the grade of the sewer, or below it; they discharge into the bayou.

Thirty-eight and a quarter miles of new sewers (38¼) have been laid, which, with the four miles of old sewers, makes forty-two and a quarter miles of sewers now in successful operation, and thirty-six miles of subsoil pipes, and one hundred and ninety-eight flush tanks. The cost of this sewer system since 1880, as furnished from engineer's office, is as follows:

Cost of removal of obstructions	$ 3,769 05
Average cost of each obstruction	10 40
Total cost of cleaning main sewers	1,675 35
Total cost of sewer system	316,843 82
Deduct from, this obstructions removed, house connections, cleaning, etc., which will leave for sewers proper	291,600 62

Since the publication of this statement a mile has been added to the system, including a twenty inch intercepting or cross sewer, at a cost of $18,738.91, extending from Bayou Gayoso to the Mississippi River, along Monroe street, rendered necessary by want of capacity of the fifteen-inch mains along the bayou.*

The system at present consists of forty-three and a quarter miles of sewers in successful operation, which embraces all the business and a greater part of the residence portion of the city, at a cost of $310,339.53, exclusive of the four miles of old sewers purchased by the city from private corporations and now included in the general system. The remaining unsewered portion of the city—two suburban wards—Ninth and Tenth—will be included as soon as circumstances will admit. This, known as the small pipe-system, has been in use long

*See Eighth Annual Report of Board of Health for 1886.

enough, and its capacity sufficiently tested, to determine its relative value as compared with other systems, and the experience of Memphis fully justifies the conclusion that the principle is correct in theory and practice as applicable to this locality.

The Water Supply.—As above stated the supply of drinking water was first obtained from shallow wells and cisterns, many of which being defective in structure, and becoming impure from sipage, the washings of roofs, and other sources of pollution caused fevers and bowel affections.*

Under the operations of the Board of Health many of these cisterns and wells have been abandoned and others made unobjectionable. More care is now taken in the construction of cisterns, and the supply from this source vastly improved. This has contributed materially toward the improvement of the general health of the city. In 1868 the city had a topographical survey made, with the view of establishiug a system of sewers and a public water supply at a cost of $43,000 †

It has been erroneously thought by many that the present water-works, which furnishes the public supply, was based upon this survey. The water company now owning and operating the water-works is a private corporation, and had nothing to do with that survey, only so far as it served their purpose in the construction of their works. The supply at present furnished though from Wolf River, one of the sources recommended by Mr. Hermany, the chief engineer of this survey, is not from the point indicated by him as suitable but from one so near the city as to be objectionable because of the pollution incident thereto.‡

It is the purpose of the city government to construct and operate its own water-works, but preliminary to this some special legislation by the the General Assembly is required before the scheme can be consummated. With this view the Legislative Council recently appointed a committee of ten prominent citizens, identified with the interest of Memphis and interested in its welfare, to consider and report on all

---

*For interesting report on the water supply of Memphis at the time of the Sanitary Survey of the National Board of Health in 1879 and '80, see report of Dr. Charles Smart, U. S. A., in Supplement No. 3, National Bulletin of Health, vol. 1, with current number for March 6, 1880.

†See report of the Chief Engineer, Chas. Hermany, to the Water-works and Sewerage Commission upon a Public Water Supply and Sewerage System for the City of Memphis, a pamphlet of 127 pages.

‡See Third Annual Report of Board of Health, City of Memphis, for 1881.

points involved, looking to the improvement of the public water supply. This committee, through one of its members, Gen. Colton Greene, has submitted a very exhaustive preliminary report to the Legislative Council. For interesting information on this subject reference is made to this report; a pamphlet of seventy-two pages.

Quarantine and Inspection Service.—Though a quarantine station was first established in 1874, eight miles below the city on President's Island, it was not used until the summer of 1878. That year it was opened too late to be of any advantage, and was abandoned when yellow fever became general in the city. In 1874 no quarantine was opened, as no yellow fever was known to be south of Memphis before it was recognized there. In 1880 the National Board of Health was called on by the authorities in Memphis to establish a quarantine and institute an inspection service for steamboats and railroads, taking New Orleans as the initial point. It was apparent from the official records that yellow fever had prevailed in New Orleans every summer to a greater or less extent for a number of years prior to this,* and in a community that had become so habituated to its presence it did not excite that apprehension which it would under other circumstances. It was, therefore, reasonable to suppose that cases might occur there which did not come under the observation of the health authorities, especially if no death was reported from the disease. But with Memphis it was different; in view of its past few years' experience the whole community, not only of the city, but the adjacent country, had become morbidly apprehensive, and these precautions, after the advent of warm weather, were deemed not only necessary to guard against any real danger, but for its moral influence in allaying this sensitive feeling and give a confidence which otherwise would not exist. This service was maintained through the summer of 1880–81–82 and 83. It created some ill feeling and acrimonious correspondence, but was of great benefit to the whole valley country. In 1884 a change in the administration of the public health affairs of New Orleans, and improved methods in their quarantine arrangements, rendered it no longer necessary, as a confidence was then established through the lower Mississippi Valley, which previously did not exist.†

Death Rate of Memphis.—The best evidences of an improved sani-

* For essay on this subject, entitled Memphis Sanitation and Quarantine, see vol. 6, Reports and Papers of Public Health Association.

† For report of this inspection service, see Reports of National Board of Health.

tary condition of a place which has had a high annual death rate, and been the subject of epidemic diseases, is freedom from epidemics and a comparatively low death rate.

The following table, covering a period of eleven years, five years prior to the sanitary reformation and six years since, that is from 1875 to 1886, shows a decided improvement in the death rate, due to sanitary work and the enforcement of the health ordinances.

Assuming the population for the first five years to be 35,000, the average death rate for the three non-epidemic years was thirty-five per thousand.

For the past five years the population has steadily increased, and is now estimated at 62,335, one-third colored. The total deaths for 1885 were 1,484; white, 666; colored, 818. The death rate per one thousand upon this estimated population is 23 80. See Seventh Annual Report of Board of Health for 1885.

Though the colored population is about one-third less than the white, it furnishes the majority of the deaths.†

The average death rate for the years 1883–84 and 85, is 24.40 per one thousand, a gain of about ten per cent.

TABLE OF MORTALITY FOR ELEVEN YEARS, FROM 1875 TO 1885, INCLUSIVE.

DISEASES.	1875	1876	1877	1878 *	1879 *	1880	1881	1882	1883	1884	1885	Total
Malarial Fever	131	128	148	135	79	41	43	55	88	100	83	1031
Typhoid Fever	19	8	14	10	7	17	17	11	21	38	24	194
Cerebro Spinal Fever	16	14	17	18	1	14	17	21	30	27	24	199
Yellow Fever	.....	.....	.....	2779	497	.....	.....	.....	.....	.....	.....	32 6
Erysipelas	6	1	6	1	12	3	9	6	3	3	5	55
Dysentery	66	79	63	30	25	45	77	29	42	54	44	554
Diarrhœa	30	67	61	46	36	49	68	49	52	95	60	613
Cholera Infantum	52	21	31	19	32	11	19	19	27	14	18	273
Scarlatina	1	49	17	1	.....	13	2	.....	2	7	1	93
Diphtheria	5	8	13	11	1	5	37	9	7	15	7	118
Croup	13	4	5	6	11	7	11	7	6	9	7	86
Small-pox	8	.....	.....	.....	.....	.....	.....	30	.....	.....	.....	38
Measles	.....	13	2	35	.....	7	7	.....	5	23	1	93
Whooping Cough	25	7	1	20	1	14	11	17	16	3	.....	115
Pneumonia	88	8	108	83	136	89	79	54	108	135	124	1091
Phthisis	172	159	180	176	143	155	171	107	206	223	225	1917
All other diseases of Lungs	18	25	28	34	10	15	41	36	42	43	37	329
Puerperal Diseases	17	6	17	1	21	8	8	1	4	5	4	105
All other causes	507	352	543	589	556	561	854	668	741	883	875	7059
	1174	1028	1254	4007	1568	1054	1471	1119	1403	1677	1484	17239

* Epidemic years.

The following tables from Eighth Annual Report, showing death rate for 1886, does not materially alter the above figures, showing an aver-

† For negro mortality of Memphis see Essay, vol. 8, Reports and Papers of the Health Association.

age for the three preceding years, though it shows a gain of one and a half, being 22.86 per one thousand, as against 24.40, the average for 1883–84 and '85.

TABLE I.

DEATH RATE PER THOUSAND POPULATION.

CENSUS OF 1883, COMPILED FROM SHOLES' DIRECTORY OF MEMPHIS, 62,335—WHITES, 40,207; COLORED, 22,128. TOTAL DEATHS FOR 1886, 1,425—WHITES, 676; COLORED, 749.

Deaths.		Rate of 1000 population.		Rate to 1000 population.	Ratio based on U.S. Census of 1880 33,593—White 18,622; Col'd 14,971.				
White.	Colored.	White.	Colored.	White & Col'd	Died White.	Died Colored.	Ratio White.	Ratio Colored.	White and Colored.
676	749	16.81	33.89	22 86	676	749	36.30	50.02	42.41

Table "A" below shows the number of deaths from residents, composed chiefly of loborers employed in Mississippi and Arkansas on levees and railroads in course of construction, which occurred in the city in 1886—whites, 209; colored 167; total, 376. The following table exhibits the ratio of mortality of the resident population proper only, the deaths of non-residents being eliminated.

TABLE II.

Population 62,335. Sholes' Directory 1883.						Population U. S. Census, 1880. 33,593.					
Deaths of residents proper.		Ratio to 1000 Population.		Ratio to 1000 population.		Death of residents only.		Ratio to 1000 Population.		Ratio to 1000 population.	
W.	C.	W.	C.	Residents proper White and Colored.		W.	C.	W.	C.	Residents proper White and Colored.	
				Dh's.	Ratio.					Dh's.	Ratio.
367	582	9.12	26.30	940	15.22	367	582	19.70	38.87	949	28.54

TABLE "A" REFERRED TO IN TABLE II.

	White	Colored.	Total.
Deaths in city of non-residents mentioned in Table 2...	75	85	160
Deaths in Hospital of non-residents mention in Table 2	83	47	130
Deaths by violence	51	35	86
Total	209	167	376

By analysis of "Mortality Table, Cause of Death" it will be observed that the death rate from the zymotic infectious diseases—scarlet fever, diphtheria, measles and small-pox—contribute comparatively very few deaths. Consumption (prevalent mostly with colored population), malarial and local diseases largely predominate. The low death rate from the above preventible infectious diseases may be fairly attributed to an improved sanitary condition and a rigid enforcement of the following sections of the health ordinance:

SECTION 1. Be it ordained by the Legislative Council, That Section 236 be amended so as to read: Every physician shall immediately report to the Board of Health in person, or in writing, any person he may attend, or be called to see, (within the city limits or one mile outside thereof,) sick with, or who has reason to suspect has either of the following named contagious diseases: Cholera, small-pox, yellow fever, scarlet fever, diphtheria, and pseudo-membraneous croup, giving his or her name, color, age, and place of residence. In the absence of a physician, the parent, guardian, employer, or head of the house, where such patient is sick shall make such report.

SEC. 2. Thereupon it shall be the duty of the Health Officer, or one of the Sanitary Police, to placard the house or residence where the above named diseases are reported to exist, said card designating the character of the disease, and is not to be removed by any other than a Health Officer or Sanitary Policeman.

SEC. 3. The death or convalescence of such sick person shall be likewise reported to the Board of Health immediately by the attending physician or person first reporting the case, when the Health Officer or Sanitary Policeman will remove said placard from the house, fumigating and disinfecting said house or room with its furniture, bedding, etc.

SEC. 118 Sanitary Code—Every physician, midwife, and other persons who shall assist, or advise, at any birth shall make a full report of the same to the Board of Health, signed by him, or herself, within five days of such birth.

The nine miles of wooden block Nicholson pavement has been removed, and there are now twenty-two and a half miles of newly paved streets, mostly with stone and gravel, which has greatly improved the drainage.

In conclusion, it may be justly claimed that the present sanitary condition of Memphis is vastly improved in every particular upon what it was seven years ago, and though the work is not complete, the standard reached, and in all essential features of its public health service, is fully abreast with the most advanced cities in the country.