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Inundations of New Orleans and their Influence on its Health.

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Gratifying evidence of the increasing interest in public health has been furnished, by the recent effort of the Hon. J. Floyd King, of Louisiana, to induce Congress to provide means for the investigation of the sanitary influence of this year's unprecedentedly wide-spread and destructive inundation of the Mississippi Valley. Whatever may be the result of this effort, it is the duty of the medical profession to contribute, for the benefit of science and of the people, such knowledge of this subject as has been heretofore and may, this year, be acquired. This view has induced me to investigate the records of previous overflows, especially in New Orleans, and to compile therefrom the following contribution to their influence on health.

Research soon proved, that this subject has thus far received very little careful study, that trustworthy records are meagre and unsatisfactory, and that, as a necessary result, there can be found those, who, trusting treacherous memories, vague impressions and very carelessly observed facts, entertain views entirely opposed to each other. To study properly the influence of overflows on health, there are at least two considerations which should be kept in mind.

First. Overflows differ in their date, duration and extent, in the irregularity and other peculiarities of the soil inundated, in the force of the current, the amount of deposit and other special conditions; and, since these variations in different years and places probably cause different results, it is not surprising that opinions as to these results should be conflicting, and that closer study of the subject, than has yet been given, is necessary to reconcile these conflicting opinions and to establish the truth.

Second. Overflows are apt to produce sickness as secondary results,—for instance, of exposure to the weather, wet clothing, bad diet, crowding in camps of refuge, etc.—and these

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well understood secondary results should not be confounded with the primary results of the overflow alone. The sanitarian needs knowledge of the influence specially of the latter.

This knowledge can now be best, though insufficiently, gained by study of the influence of overflows on cities, and for these two reasons: In the Mississippi Valley there are no rural localities which register statistics even of death, much less of sickness: such statistics are indispensable to trustworthy conclusions; and, only in cities can even mortality statistics be obtained. In the next place, the secondary results above alluded to prevail, to much less extent, in cities than in the country, and therefore can be better eliminated from the determination of the problem of the sole influence of an overflow on health.

It is not presumed, however, that a satisfactory solution of the problem for cities, much less of one city, would, at the same time, solve it for the country. Dr. Devron, of New Orleans, well known for his sanitary experience and knowledge, holds, as a result of his observation, that, while overflows have not manifested any malign influence on the public health of this city, as a whole, yet, such influence has been noticeable in the sparse population inhabiting those outskirts, where undergrowths of trees and plants interfere with drainage and with the removal of the filth deposited by the water. For this or other reasons, what holds good for New Orleans may not hold good for even adjacent rural localities. However, for the reasons given, and also because the meagre records of the overflows in this city are infinitely more meagre for the country, this article is limited, almost exclusively, to the compilation of our records in regard to the former. Although the imperfections of this contribution are fully appreciated by me, it is none the less hoped, that, in as much as my research has failed to discover any article in medical literature on the present subject, this contribution may prove instructive and may aid others, in the future, to investigate the subject more thoroughly.

New Orleans fronts on the Mississippi river, and has in its rear, at a distance varying from four to seven-and-a-half

miles, Lake Pontchartrain. The average width, from river to lake, of the densely inhabited portion of the city, does not exceed a mile and a-half; thus leaving much the larger area, between the river and lake, very sparsely inhabited, in fact much of it is undrained swamp-land. The river front is nearly eleven feet above sea level, hence the city, whether inundated by the river or by storms from the lake or, oftener still, by the waters of both river and lake co-operating, is always inundated by back-water from the lake (tide-water) in the rear, never completely and, of course, to variable extent; the recession of the water, from the maximum extent, being generally within a few hours or days. The modus operandi of overflows is sufficiently explained in subsequent quotations.

Since the foundation of New Orleans in 1718, not less than eight partial inundations by the river are recorded; viz.: in 1719,* 1735, 1785, 1791, 1799, 1816, 1849 and 1862. The partial inundations, by Lake Pontchartrain or by this lake aided by the river, have been much more numerous, however, no records of these have been sought prior to 1830, and, it is probable, that records of all which have occurred since then, have not been found, even if ever made. The records of nine such overflows, since 1830, have been found, and these occurred in the following years, viz.: 1831, 1837, 1846, 1856, 1861, 1868, 1869, 1871 and 1881. Of these seventeen inundations, no records, respecting their influence on health, have been found in regard to the first two, and only incidental allusions to the next three, therefore my record will begin with the overflow of 1816, and will contain such pertinent facts as I have been enabled to gather in reference to the twelve overflows, since 1816, of whose occurrence I have succeeded in finding some evidence. In order to estimate their influence on health, it is indispensable to compare the mortality statistics of years of overflow with years free therefrom, hence such statistics, as complete as procurable, have been recorded, together with the facts relating to each overflow. These data are presented in the following:

* Most authorities say 1718, *the year of foundation*, but New Orleans was founded in August, 1718, too late for an inundation by the Mississippi, and there is authority, for the more probable statement, that this overflow was from March 25th to June 24th, 1719.

TABULAR STATEMENT OF TWELVE INUNDATIONS OF NEW ORLEANS, WITH

Years of Overfl'w	CAUSE, Whether by the Mississippi River or by Lake Pontchartrain.	DATE.	MAXIMUM EXTENT on Canal st. A Cen- tral st. running from River to Lake.
1816	Miss. River, McCarty's Crevasse at Carrollton.	May 10th to June 6th	Dauphine st., 8 squares from the river-front.
1831	Lake Pontchartrain...	August 17th to ?.....	Dauphine st.
1837	" "	October	?
1846	" "	April 6th to about 12th	Burgundy st., 9 squares from the river-front.
1849	Miss. R, Sauv6's Cre- vasse above Carrollton	May 3d to June 22d...	Bourbon st., 7 squares from the river-front.
1856	Lake Pontchartrain...	August 13th to ?.....	Claiborne st., 17 squares from the river-front.
1861	" "	Ab't 10 d'ys early in Oct	Rampart st., 10 squares from the river-front.
1862	Miss. R., Crevasse in 6th District	May 10 to ab'ut July 1	Limited to a small part of the rear of city above Toledano street.
1868	Lake Pontchartrain...	First week of October.	Burgundy st., 9 squares from river- front, for a few hours.
1869	" "	Sept. 5, for a few days.	Limited to a small part of the rear of the city.
1871	" "	3d to 16th June	Rampart st., 10 squares from river- front.
1881	" "	7th to about 19th Feb.	Marais street, 14 squares from the river-front.
1882	B'ckw'ter fr'm Miss. R.	May 11th, maximum, to May 24th.	Rear of Algiers or 5th Dist., Gret- na and Goulds- borough.

NOTE.—A well informed citizen alleges, that two overflows, (of which I have found both lasted about one week, about the last of Setember. In 1853, the year of there were 10,564 deaths, of which 2425 by Yellow Fever; in 1855, there were 10,096 decreased, as usual, after October 1st, the reported approximate date of the alleged

MORTALITY STATISTICS ILLUSTRATING THEIR INFLUENCE ON HEALTH.

Total Annual Deaths.	DEATHS in the Preceding and Succeeding non-overflow Years.	REMARKS.
651	1252 in 1815, 1772 in 1817.	Epidemic Yellow Fever in 1817.
1926	2022 in 1830, 8099 in 1832.	Y. F. in 1832, also the first and the most violent Ep. of Cholera ever in N. O.
4807	2734 in 1836, 2606 in 1838.	Violent Ep. of Y. F. in 1837.
4220	2783 in 1845, 9043 in 1847.	Floating Pop. much increased by Mexican War in 1846-7, and violent Ep. Y. F. in 1847.
9862	8026 in 1848, 8086 in 1850.	In 1849, Cholera caused 3176, and Y. F., 752 deaths.
5689	10,096 in 1855, of which 2670 by Y. F., 5581 in 1857.	For the 4 months, Sept. to Dec., 1956 deaths in 1856, and 1898 in 1857.
● 5772	7341 in 1860, 6278 in 1862.	War between the States.
6278	5772 in 1861, 7172 in 1863.	" " " "
5343	10,096 in 1867, of which 3107 by Y. F., 6001 in 1869.	For the 3 months, Oct. to Dec., 1498 deaths in 1868, 1602 in 1869, and 1904 in 1870, of which 353 by Y. F.
6001	5343 in 1868, 7391 in 1870.	
6059	7391 in 1870, 6122 in 1872.	For the 6 months, July to Dec., 3276 deaths in 1871, and 2912 in 1872.
6406	5623 in 1880.	

no published records), occurred from the Lake, one in 1853 the other [in 1854 or 1855, that "the great epidemic," there were 15,787 deaths, of which 7849 by Yellow Fever; in 1854 deaths, of which 2670 by Yellow Fever. In all these years the epidemics and the deaths overflows.

In addition to the facts cited in the table, other records have been found and all of these will now be presented.

OVERFLOW OF 1816,

and therewith of 1785, 1791, and 1799.

Fenner's "Southern Medical Reports," pp. 56-62, Vol. I, quoted from a New Orleans newspaper, May 25th, 1816, reporting then the overflow of 1816, as follows:

"Old authorities recount three inundations caused by crevasses at this same place. One occurred in 1785 and another in 1791. There was not a greater mortality upon these two years. Those who doubt may go and consult the mortuary register kept by our venerable pastor. A third inundation occurred in 1799. There died this year more or less, but not in consequence of the inundation. A vessel arrived from the north, where yellow fever had been committing severe ravages for a long time, which introduced into this city patients and the disease. This circumstance is well known to many respectable persons, and let their intelligence and information dispel all the apprehensions which have sprung out of the popular tales." In respect to the overflow of 1816, it is reported that "the ensuing summer was a remarkably healthy one," as is amply confirmed by the mortality statistics cited in the table.

The inundation of 1816, the most extensive and prolonged of which we have record, except that of 1849, proved at least that an overflow in May, by the river, did not necessarily cause either an epidemic or any increase of sickness.

1831.

An overflow in August from Lake Pontchartrain was not followed, apparently, by any injury to health, since the annual deaths were less than the average and fewer than in 1830, a non-overflow year. In 1830 there were 117 and in 1831 only 2 deaths by yellow fever.

1837.

The overflow of this year occurred at the close of a very severe epidemic of yellow fever, and there is nothing to indicate an unfavorable influence on health.

1846.

The May number, 1846, of the NEW ORLEANS MEDICAL AND SURICAL JOURNAL, pp. 825 -7, Vol 2, reported the storm which began April 4th and by the 6th had flooded a large portion of the city. This flood receded in about a week. On p. 827 the editor stated as follows :

“ We have thought it proper to make this extended notice of the inundation, with the view of seeing what effect it may have on the future state of health. Two occurrences of a like nature happened, the first in 1831, and the second in 1837. In 1831 the inundation took place in August; yet, though the swamp in the rear of the city was highly offensive from the effluvia of putrid fish, there did not occur a single case of yellow fever. The year, indeed, was a remarkably healthy one. In 1832, however, we had a severe epidemic, both of yellow fever and cholera. In 1837 the inundation occurred in October, during the prevalence of a violent epidemic of yellow fever. The fever this year greatly abated before the usual period, and, by many, this effect was attributed to the gale and inundation. Our own opinion is, that the disease abated, for cease it did not, for want of subjects. We are now studying closely the remote cause of yellow fever, and we deem it proper to note everything that may have a bearing on the subject.

We have been informed, and on good authority, that the inundation of 1816, from the crevasse at Carrollton, was like the inundation from the lake in 1831, followed by no serious sickness. This event occurred in the early part of May, yet the city escaped the visitation of yellow fever; but in 1817, a violent epidemic occurred.”

The July No. p. 135, Vol. III. reported. “ Intermittent and remittent fevers have not prevailed to so great an extent as usual this season, up to date,” but, “ an increased number of cases of dysentery and other derangements of the bowels” have occurred.

The September No., p. 273, Vol. 3, reported: “ Our city may be said to be in the enjoyment of uninterrupted and *unmitigated*

health. So little disease of any kind whatever was perhaps never known in New Orleans at any season of the year as exists at this time. This is certainly very extraordinary, when we take into consideration the sultry heat of the season, the immense quantity of rain that has fallen, the unusual filthy state of the streets, and the great influx of unacclimated soldiers going to and returning from the seat of war."

The November No., p. 415, Vol. 3, reported: "With this exception, [a few sporadic cases of yellow fever] there has been no disease of special notice, the state of health has been most excellent."

The January No., 1847, p. 556, Vol. 3, reported: "With the exception of yellow fever we had no sickness worthy of particular notice." There were only 160 deaths by yellow fever in 1846.

Before referring to the next overflow in 1848, it may be well, to state that, in Barton's "Report of the Sanitary Commission of New Orleans, 1853," the inundation of 1844 is erroneously assigned to 1844; and to introduce, in this place, the following records in regard to the overflows of 1844 and of 1850, both of which seriously afflicted the surrounding country but not the city of New Orleans.

OVERFLOWS OF 1844 AND 1850 IN THE COUNTRY.

The New Orleans Medical and Surgical Journal, Volume 1, p. 247, October, 1844, referring to the extensive overflow in the country, as being at its highest point July 30th, 1844, reported as follows;

"Let it be noted as a fact, which we think will be substantiated by the testimony of the profession, that, during the present year, when the Mississippi and its tributaries have been higher than they were almost ever known before, *all the River towns from New Orleans upwards have been unusually healthy; whilst the interior and uplands throughout the Southwest have generally been sickly.* It has long been observed, however, that whenever the river banks and valley localities are healthy, the interior of the country is apt to be sickly; and vice versa. This might naturally be expected from the difference of topography." The above "long been observed" and "naturally be expected" are most questionable.

In respect to the overflow in 1850 of extensive rural districts in the Mississippi Valley, Fenner's "Southern Medical Reports," p. 754, Volume II, stated that, "as a general remark,

it is worth mentioning that, notwithstanding the extensive inundation of 1850, the year was as healthy, if not more so, than usual." From one part of the country, overflowed in May and June, 1850, Trinity, La., Dr. A. B. Kilpatrick reported, p. 165, Volume II, Fenner's Southern Medical Reports, as follows: "The year in this section of the country, with the single exception of a transient visitation of the cholera in the month of February, has been as healthy as any year preceding. It has been contended by many, that *the seasons accompanying and immediately succeeding overflows are more healthy than others*, and the physicians in this vicinity contend that such has been the case this year."

1849.

In this year occurred the most disastrous overflow which ever afflicted New Orleans, and in the same year an excessive mortality. This was due chiefly to a severe epidemic of cholera, which, however, began and was severest in December, 1848, and the deaths by this and all diseases were much more numerous in the first half of the year, during which nearly two-thirds of the annual deaths occurred, than in the second half after the overflow had disappeared. To the 376 deaths by cholera, yellow fever added 752, the first case reported by the Board of Health having been admitted to the Charity Hospital, July 28th.

The following quotations concerning this overflow deserve record.

The July No., 1849, of the NEW ORLEANS MEDICAL AND SURGICAL JOURNAL, pages 139, 140, vol. 6, reported as follows:

"It remains to be seen what effect the inundation of a large portion of the city, may have upon the progress and symptoms of this disease [cholera]. About the first of May, 1849, the levee, about nine inches above the city, yielding to the pressure of the waters, gave way, and through this crevasse a large volume of water, from the swollen current of the Mississippi was forced into the swamps and low lands in the rear of the First and Second Municipalities [the present First and Second Districts], and also a part of Lafayette [the present Fourth District], located above New Orleans. This immense body of water, unchecked, soon began to encroach upon the inhabited

parts of the city bordering the swamp-lands and lying between the city proper and the lake. In about one month from the formation of the crevasse, that is to say, about the first of June, the water reached its highest mark, and since that time it has daily declined, and at this hour (June 18th, 1849) a portion of the inundated district has been relieved of the stagnant water. Nearly one-third of the First and Second Municipalities were under the flood, at the highest water mark. Of course much suffering and damage to property were experienced in this part of the city.

Since the flood began to retire, a deposit of alluvion, containing a large percentage of vegetable and animal matter, has been precipitated in our streets and gutters; all this, if left exposed to the action of a June and July sun, may become the active agent of disease—the *materies morborum*.

It is but just to state, that the authorities of the city, with our patriotic Mayor as leader, are making extraordinary efforts to rid us of this deposit, as the water recedes.

The month of June is usually more oppressive than any other of the twelve months. Since the first of this month to the 20th, the thermometer has rarely fallen below 90° in the shade; occasionally it has reached above that figure at meridian. The question is asked from every quarter, what influence will this overflow exert upon the health of this city? In 1816, when the inundation was almost equal to the present, the health of New Orleans, according to the testimony of the oldest inhabitants, was remarkably good, there being but few cases of serious sickness, and not a trace of yellow fever. Although the limits of the town were much more contracted then than now, yet, but little was done to guard against, or counteract the effects of the inundation. This fact, although highly encouraging, should not lead the "authorities" to relax their efforts in cleansing this great Augean stable, so long the receptacle of fœtid deposits, of both putrefying animal and vegetable matter. As we have no great faith in the so-called influence of malaria (the result of about ten years observation in this city) upon human health, we are inclined to believe that the health of the city will not be seriously endangered by the overflow.

If chloride of lime, or some other powerful disinfectant or absorbent, be freely used in the district overflowed, we shall enjoy, perhaps, more than our usual exemption from sickness, notwithstanding the predictions to the contrary of alarmists and miasmatisers. But it is idle to speculate on a subject about which so great a diversity of opinion has been expressed; time will solve the problem, and let us not therefore anticipate the ills and misfortunes of life, but wait, with calm resignation (doing in the interval everything in our power to avert disease), until the moment arrives when we shall be called on to act our part."

Fenner's Southern Medical Reports, p. 70, Vol. II., reported: "On the 22d [June], the water was nearly gone from the city, and copious showers of rain washed off the terrible filth which, for forty days, had stood stagnant over street, yard and tenement. The pavements were much injured, the gutters full of mud and the bridges swept away."

The September No., 1849, p. 282, Vol. 6, of the NEW ORLEANS MEDICAL AND SURGICAL JOURNAL, reported: "We ventured to predict, in a previous publication, that the inundation, so far from proving detrimental to the health of the city, might possibly remove many causes of disease, and thereby reduce the bills of mortality. Such has indeed been the fact, and we refer to the weekly record of deaths, in another part of this paper, to verify our prediction. During the latter part of July and up to date, the heat has been quite oppressive, the thermometer ranging at, and even above 90° F., for a short time during the day. Cases of coup de soleil have been of daily occurrence since the intense heat commenced."

Another observation, Fenner's Southern Medical Reports, p. 82, Vol. II., deserves record: "August and September [1850] were remarkable dry, with a prevalence of northerly winds, which, in connection with *the fact that upon all previous occasions, so far as our knowledge goes, the summers next succeeding those in which the city was inundated were very sickly*, gave rise to the constant expectation of a severe epidemic of yellow fever. But the result was, that although there was a great

deal of fever, it was mostly of a very mild character." The facts recorded in the table certainly do not justify the conclusion that, on "all previous occasions," the summer next succeeding an inundation was specially sickly. This conclusion was probably derived from statements derived from the memory of "the oldest inhabitant," an authority whom statisticians have long since learned to pay little attention to when unsupported by statistical records.

1856.

The September No., 1856. NEW ORLEANS MEDICAL AND SURGICAL JOURNAL, p. 289, Vol. XIV., reported as follows: Referring to the great storm, August 10th to 13th, "The sea swept over the out-lying islands, and the depressed littoral of Louisiana, drowning hundreds of its inhabitants and elevating the waters of Lake Pontchartrain whereby a large district of New Orleans was inundated. The rain flood from the higher or river-belt met, face to face, the sea in the lower or rear district, covering the streets and floors of the houses several feet deep for nearly a week. In the meanwhile, since the recession of the flood, the salubrity of the city has been surpassed by few, if any cities of similar populousness in the Republic."

The mortality statistics in the table certainly fail to indicate any unfavorable influence of the flood on health.

1861.

The annual mortality was unusually slight and there are no facts indicative of any unfavorable influence of the overflow on health. No special reports have been found for either 1861, or for the three following years.

1862.

No unfavorable conclusion can be drawn from the mortality statistics. In any case, however, the evidence would be unsatisfactory, since only a limited part of a sparsely inhabited section of the city was inundated.

1868.

This year, after as well as before the overflow, was characterized by an unusually small mortality; as has repeatedly oc-

curred in the year which followed, as did 1868, a year noted for the prevalence of a very severe epidemic of yellow fever.

1869

The mortality statistics fail to indicate any unfavorable influence of this overflow, which, however, was too limited in duration and extent to afford satisfactory evidence.

1871.

The records for 1871 are fuller and more instructive than for any other overflow. The following extracts are from the Annual Report of the State Board of Health for 1871. The President, Dr. C. B. White, reported, pp. 33-34, as follows:

“During the spring months, the waters of the Mississippi River, flowing through the crevasse at Bonnet Carre [about 20 miles above New Orleans], found their way into Lake Pontchartrain. About the first of June occurred a long succession of strong winds, which interfered with the outflow of the waters of Lake Pontchartrain, unusually augmented by the break in the river levee. The result of this combination of circumstances was an extraordinary altitude of the waters of the lake and of the two navigation canals leading thence to the heart of the city. At this time, June 3d, occurred a break in the banks of the New Canal, as a result of which that portion of the First and Second Districts lying between the New and Old Canals and between Basin street and the Metairie Ridge, was submerged. [This included one Ward, the 3d, of the First and one Ward, the 4th, of the Second District.] After some days the water became entirely stagnant and disagreeable odors were given off. To remedy this state of matters, and hoping possibly to do something to prevent future ill-health, instructions were given to disinfect and deodorize with carbolic acid and salts of iron. The details of the work will be found in the reports of Drs. Clark and Albers. The overflowed region enjoyed a remarkable exemption from malarial fevers during the remainder of the year.”

Dr. J. S. Clark, Sanitary Inspector First District, reported, pp. 54-6, as follows: “The water, with which this portion of the city was submerged, was from the drainage canal, where

was the collected filth of the city, which, owing to the high stage of the backwater, had not been forced out for several days previously. Added to this were the contents of every sink, cesspool, stable and gutter, with garbage from the dumping ground, dead domestic animals, etc., etc." This refers to the 3d Ward, the most populous in the city. "The water, air and soil, thus poisoned, necessarily produced a sickening smell, and, in compliance with your instructions, at the first indication of the receding flood, a thorough and systematic disinfection was undertaken." For this purpose, 2,960 gallons of carbolic acid and 145 gallons of solution of perchloride of iron were used. A statistical table of deaths by fevers, usually prevalent, is given for the non-overflow year 1870 and the overflow year 1871, and this table fully justifies Dr. Clark's conclusion, that "thus it will be seen that the mortality from fevers was *less*, for the months subsequent to the overflow, than for the corresponding months of 1870."

Dr. F. B. Albers, Sanitary Inspector Second District, reported, pp. 62-64, as follows: "The Second District has been remarkably healthy during the entire year, notwithstanding the overflow from Lake Pontchartrain, which inundated that part of the city lying between the old Carondelet Canal and the New Canal, as high up as Basin street, from the 4th of June to the 16th, at which latter date the water returned into the banks of the canal." "When the levee at the foot of Hagan avenue broke, on Saturday, the 3d, the water was so high in the canals that, by Sunday morning, the entire 4th Ward to the Old Basin was inundated as far up as Franklin street. The water continued to rise gradually until June 8th, when it appeared to have come to a stand. At this time the water presented the appearance of an offensive and putrid cesspool, which was observed particularly whenever it was stirred up, and showed that a great deposit was taking place, all along its course, from the contents of sinks, cesspools and stables, with garbage from the dumping-grounds, numberless dead animals, etc., which produced a sickening smell and had an unhealthy effect on those exposed to it.

On the 8th of June, when the water appeared to have reached its highest stage, I commenced immediately, according to your instructions, to disinfect the inundated district all along the edge of the water from Canal street to the Old Basin with carbolic acid and perchloride of iron. The latter was discontinued on 10th, 11th and 12th, as the paved streets did not so essentially require the application as those that were not paved and it was applied again on the 13th, when the water had receded beyond Claiborne street. The process of disinfection was continued from day to day, every morning and evening, following up the water as it went down, and in this process of disinfection there were included, besides the streets and gutters, all the yards, stagnant pools and water closets of each house in the overflowed district; and there were consumed altogether one hundred barrels of carbolic acid, two barrels of copperas and one hundred and fifty gallons of perchloride of iron.

On the 10th, the water had already receded as far as Claiborne street, on the 13th to Galvez, on the 15th to Broad, and by the 16th it had been completely drained off the entire district, and all that part of the city is now [June 22d] as free from bad odors and injurious deposits from the overflow as if the latter had not taken place."

"When it is taken into consideration, that the overflow took place at that particular season of the year when the heat of the sun is intense, and when is also considered the vast amount of filth, which was at the time washed up and diffused through that part of the city which comprises the Fourth Ward and is inhabited by 11,000 people (the domicils of 8,500 of whom were overflowed), it might naturally be supposed that this would cause much sickness during the ensuing summer, but thanks to timely and abundant rains with which the city was blessed, assisted by the energetic exertions of the entire Sanitary Police of the city (in insisting on the greatest cleanliness and distributing carbolic acid freely wherever needed and particularly as the water subsided), the results have been very extraordinary, as testified by the rate of mortality from malarial fevers, that

took place during the two successive years of 1870 and 1871. There were the following deaths from malarial fevers in the Fourth Ward, the only one (in the Second District) afflicted by the overflow :

1870:	Remittent	5,	Malarial	3,	Congest.	6,	Pernicious	5,	Intermit.	4,	Bilious	5—28
1871:	"	1,	"	2,	"	4,	"	3,	"	1,	"	2—13"

1881

Dr. Joseph Holt, Sanitary Inspector, First District, reported, p. 296, Annual Report for 1881, as follows: "The signal event of the year was the great overflow from the Lake of a large area, comprising the rear and nearly half the First District. Most dire and lamentable results were predicted by many as a consequence of the drying up. Deadly miasmas, intensified by the stench from the innumerable carcasses of domestic animals, fowls and particularly from decomposing schools of fish—all of this under a burning sun—were predicted. As the waters receded, I carefully inspected the ground, and was especially struck with the fact that the heretofore dirty backyards, streets and even houses, had the appearance of having enjoyed a thorough washing out, and I saw about a dozen dead animals and heard of a man who had seen a dead fish. The event of the summer would seem to suggest an overflow as a providential sanitary measure."

Dr. W. R. Mandeville, Sanitary Inspector, Second District, reported, p. 299, Annual Report for 1881, as follows: "The condition of the 'Old Basin' [i.e., the Old Carondelet Canal], particularly demands attention. The levees on both sides should be raised so as to preclude the possibility of another overflow like that which, in February last, rendered thousands of people homeless, and destroyed live stock and other property to an enormous amount."

Dr. R. A. Bayley, Sanitary Inspector, Fourth District, reported, pp. 305-7, Annual Report for 1881, as follows: "The rear of this district is particularly low and subject to overflows from the canals and New Basin [the harbor of one of the two canals], in case of high water in the Lake. The area of de-

pression was clearly defined during the inundation in the beginning of the year. The water limits could be traced, at the time, by a straight line starting from the corner of Felicity and Freret streets, and extending on up diagonally to the corner of Carondelet and Toledano streets. The section back of St. Charles street was thus shown to be in great need of grading, and especially above Washington street. When the waters from the overflow in January, subsided back of town, leaving deposits of decayed vegetable and animal matter, it was naturally supposed that much sickness would ensue, as a consequence, in the way of malarial and typhoid fevers. Contrary to expectation, the waters seemed to act in the manner of flushing, cleansing the ditches and streets of accumulated filth, and not leaving many carcasses of animals in this district. The weather was cool and dry at the time, however, which had the effect of counteracting the influence of malarias."

The Inspectors of the four other (of the present seven) districts of New Orleans do not refer, in their reports, to the overflow of 1881.

It is noteworthy, that, while Drs. Holt and Bayley fail to report the systematic and thorough disinfection and cleansing practised in 1871, but not practised at all in 1881 (to the best of my knowledge and belief), yet, they claim results no less favorable, and the mortality statistics justify, no doubt, this claim.

GENERAL CONCLUSION.

The evidence, now presented, records all the facts and views pertinent to my subject, which I have had time and means to collect. They fail to indicate that the partial inundations of New Orleans have ever influenced unfavorably its mortality, whether by yellow fever, by cholera, by malarial fevers or by diseases generally. On the contrary, the evidence, though imperfect and not fully conclusive, justifies the inference, that the deposit and decomposition of filth, and any other promoters of disease which may be due directly to inundations, are more than counterbalanced by the flood, which first covers up the soil, from whence springs so much disease, and then helps

to cleanse it. If New Orleans were kept always perfectly clean, which, far from the case now, was less so in remoter times, the influence of an overflow might then prove to be comparatively injurious.

The author of the above article has procured a few reports from physicians in the country upon the influence on health of overflows in rural districts, and, wishing to compile an article on this branch of the subject, would be greatly obliged for any contributions thereon.