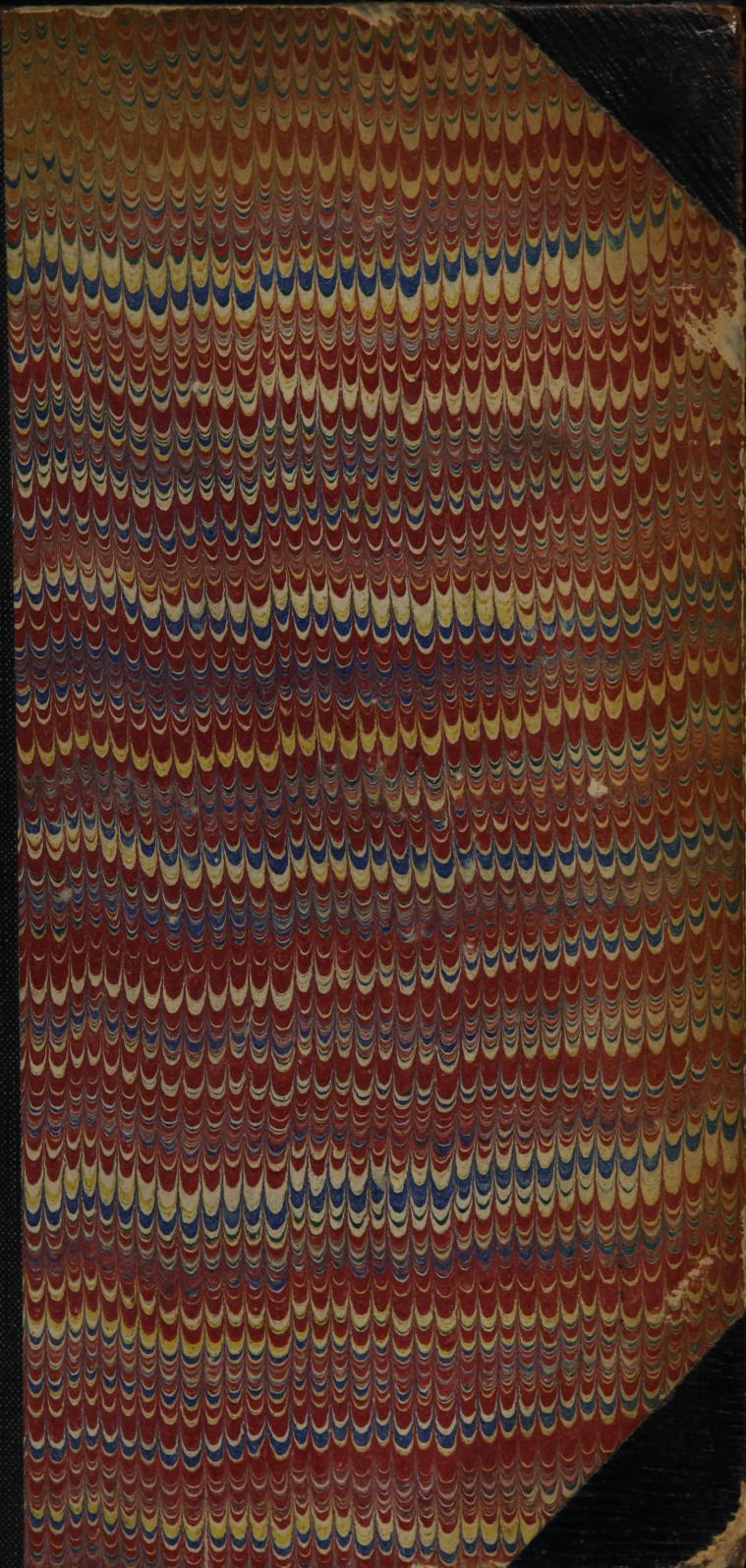


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TABLEAUX

OF

NEW ORLEANS,

BY

BENNET DOWLER, M. D.



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TABLEAUX,

GEOGRAPHICAL, COMMERCIAL, GEOLOGICAL AND SANITARY,

OF

NEW ORLEANS:

BY BENNETT DOWLER, M.D.,

Member of the Academy of Natural Sciences, of Philadelphia; Fellow of the Medico Chirurgical College of the same city;
Member of the American Medical Association, and Chairman of the Committee of Medical Sciences to the same,
for the years 1850-'51.

Although industry, capital and commerce, may build up and sustain a great city in an unfavorable situation, in an ungenial climate, and upon a sterile soil, remote from navigable rivers and oceanic harbors, yet these conditions being permanent and uncontrollable, must ever operate as retarding and limitary causes upon the vital progression and opulence of an urban community.

The Crusades, for a time, made Bruges (an inland town of Belgium) the greatest emporium in Europe. Within a few years, railroads have absorbed a great part of the capital of the world, and have given a great impetus to the growth of many cities. But it remains to be proved that these highways over mountains, through snows and ice, requiring constant repairs and reconstructions, can, through all coming time, successfully compete with that great natural highway, the Mississippi; which, with its tributaries,* is more extensive than all the railways of the united world; and, withal, as durable as the stars, as free as the air; neither wearing out, nor rotting out, nor rusting out; and last, though not least, out of debt. It borrows no money, pays no accumulating interest; is not governed by corporations; is not bought cheap to be sold dear, by speculators learned in the science of percentage.

The climate, geographical position and natural advantages of New Orleans, are guaranties of what she ought to be, and will be. Since "the manifest destiny" is the most agreeable part of the subject, it will not be necessary to go into the history of what New Orleans is. A thorough examination of the supposed decadency of the city, and the causes of it—whether temporary or perpetual, contingent or inherent, removable or irremovable, social or political—whether triune corporations or a consolidated unity of government, free banking or no banking, the homestead exemption or the uttermost farthing, the old constitution or a new invention, are topics incompatible with the aims of this sketch; as are, also, the statistics of flatboats, steamboats, ships, lard, bacon, flour, tobacco, sugar, cotton, wharfages, prices current, markets, cotton presses, levees, canals, railways, roads, coasts, public squares, water-works, gas-works, customhouse, mint, churches, colleges, schools, courts, asylums, hospitals, charities, cemeteries, Board of Health, police, soldiers, societies, debts, specie, exchange, population, races, colors, languages, zoology, botany, latitude, longitude, and so on.

* From the general configuration of the country, and the uniformity of its levels, Louisiana would seem peculiarly favorable for the construction of both canals and railroads; many of the former, called bayous, made by the hand of nature, rival the best artificial canals which have cost millions of dollars, being sometimes of sufficient depth for large vessels.

Practical men (so called) who have speculated so much upon the remedial measures necessary for New Orleans, without having done anything, cannot reasonably object to further inquiry.

Although New Orleans needs railroads without delay—the one north of the Ohio, and the other west to the Rio Grande—with but a small probability of getting either very soon—yet these alone, so long as capital and capitalists absent themselves and take up their abode elsewhere—so long as manufactures, ship-building and the like, are neglected, will not make the city what she ought to be—the mistress of the two Americas. But perhaps a new generation must be waited for, as the present one seems to think that the South is adapted to the production, but not to the manufacturing of the raw material.

It is but too true that the population of New Orleans has not increased as rapidly as that of New York. But this fact is not of itself a sure harbinger of an approaching ruin, that shall number New Orleans with fallen Babylon, Nineveh, Palmyra and Thebes. Louisiana, a comparatively new State, whose natural advantages are scarcely known—certainly not developed—is, nevertheless, prosperous, if commercial superiority be a criterion. Take, for example, a year—that of 1840, ending with September, in which the whole domestic produce exported from the United States was in value \$113,895,634; of which Louisiana alone exported \$32,998,059—say thirty-three millions—one-third of the whole; equal to nearly one hundred dollars for every person, white and black, in the State; while the residue of the United States affords only forty-four dollars as the average export for each individual. Thus, Louisiana exports about four times more than Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey and Delaware united, and about one-third more than the great State of New York. This exorbitant commercial superiority in favor of Louisiana, may have been somewhat diminished of late.

Were it possible to draw aside for a moment the veil which hides the future, so as to take a panoramic view of the drama to be enacted in the coming century, would we not see the overgrown cities of cold climates either stationary or declining, the streams of population flowing towards the sun—towards the valleys of the Mississippi, Orinoco, Amazon and Plata—New Orleans the central emporium of all, advancing in population, manufactures, commerce and greatness.

The stream of emigration in the United States flows, at present, chiefly to the West and North-west; but the fertility of the soil, and the geniality of the climate of the South-western valleys of the Mississippi and its tributaries, will ultimately draw to themselves by the most powerful motive, self-interest, a dense population like that which long flourished in the valley of the Nile; although the clearing of dense southern forests, and the draining of the low lands, (so expensive at first) may long delay this result. Had an equal amount of industrial skill been expended for two centuries upon the draining and improving those regions, as has been expended upon the sterile, stony, and cold lands of New England, the rewards of labor would doubtlessly have been greater in the former.

The utilitarian character of modern science and art has increased the means of subsistence in Europe within the last three or four centuries, probably four-fold. Hence the constant increase of population in most nations of that quarter of the world; but the time has come when the ratio of increase is greater than that of the means of subsistence; the former must sink to the level of the latter. The maximum of subsistence will be reached; all increase of population beyond these means will bring misery and death, or emigration to America, where the means of subsistence are more easily obtained, particularly in the rich valleys of the South.

The believers in the decadency of New Orleans doubtlessly regard a bird in the hand as worth two in the bush, and one to-day better than two to-morrow. It must be conceded that summer absenteeism, the neglect of manufactures, and the great preponderance of the planting interest in the South, tends to repress the growth of Southern cities. The rural population that produces the raw material, can have but a slight connection with the urban population that consumes little, and manufactures nothing. It has been said that Paris is France; but it cannot be said that New Orleans is Louisiana. The rural and the city populations are to a great degree strangers to each other. The material interests of these classes are not completely identical—are not founded on mutual production, mutual exchanges, or mutual profits. For the

planter, the city is a great store-house for him, its inhabitants are but factors, agents, commission merchants, bankers; he does not receive for his cotton bales New Orleans fabrics, made of the same. The goods that he purchases, be they cottons or woollens, ploughs or axes, hats or shoes, are but the products of distant lands. In selling and in buying, he is alike dealing with agents, not with producers. The commissions may remain with the former, but the the chief profits go to the latter; that is, out of the city. This is the charmed circle. The Legislature cannot remove the enchantment, but the rolling of machinery, and the smoke of workshops, can. "Silence is great." But a citizen of New Orleans can hardly avoid thinking aloud, as to the jealousy manifested towards the city, in the enactments of the Legislature of Louisiana.

Although an exclusively planting and agricultural interest is, in some degree, antagonistic to the growth of large non-manufacturing cities, whose population consists of the non-producing classes, as agents, merchants, bankers, lawyers, doctors, and itinerant speculators; yet New Orleans, even in this point of view, is destined to surpass all Southern cities, as indicated by climate, position, and natural advantages. Arts, trades, and manufactures, must finally stand side by side with commerce.

During the French Revolution of 1789, there was an individual called the "The Orator of the Human Race." Such an orator might have said, without arrogance, that the human race has erred in concentrating itself too near the icy circle! Go towards the sun, to fertile lands, to southern valley's, where climate itself becomes capital!

But in what sense is climate capital? Political economists, who have tortured all languages in order to give a satisfactory definition of capital, have omitted this element altogether: "Capital" is that portion of the material possessions of a country destined to be employed with a view to profit,—(*Malthus*.) "Food, clothing, raw materials, are necessary to give effect to labor." (*Ricardo*.—"Accumulation de valeurs soustraites á la consumption improductive."—(*Say*)

The sense in which climate is capital to a city, a country, or an individual, will best be explained, not merely by words, but by facts and historical examples. "Three centuries since a few cattle, horses, and some other domestic animals imported from Europe, accidentally strayed from their owners, and wandered upon the plateaux, llanos, and pampas of America, wherein they multiplied without human care, so as almost to cover plains sufficiently large for all the inhabitants of Europe to dwell in without crowding. From the plains of Orinoco to the lake of Mairacabo, M. Dupons reckoned that 1,200,000 oxen, 180,000 horses, and 90,000 mules, wandered at large. In Quito, asses multiplied and ran wild, so as to become a nuisance. In 27 years after the discovery of St. Domingo, the cattle taken there from Europe, a few pair, had multiplied so that droves from 4000 to 8000 were not uncommon. The same increase took place in New Spain, [Mexico.] In 1587, the number of hides exported from St. Domingo alone was 35,444, and from New Spain, 65 years after the taking of Mexico, 64,350. Hogs multiplied in the same manner." (*Lyell*.) Buenos Ayres alone has three millions of cattle roaming without owners, whilst in Uruguay, many estates among a total population of only 115,000, have each from 60,000 to 200,000. (*Macgregor*.) The Llanos of Venezuela, on the Orinoco, have 2,400,000 horned cattle, 1,900,000 sheep, 400,000 hogs. (*Humboldt*.) Now, these animals, so necessary to man, are, excepting the original stock, the creations and gifts of the climate, as much as the luxuriant grasses on which they graze throughout the year, and constitute capital just as much as if they had been fed upon artificial, instead of natural meadows, and had been stabled and fed by man more than half of each year of their lives, to prevent them from perishing from cold and hunger. It would be difficult, perhaps impossible, for all the Northern nations of the world, with their united capital, to rear and sustain an equal number of these animals, (as described above,) in a rigorous climate. A climate that produces cattle, hogs, sheep, horses, grasses and the like, without human labor, can only be surpassed by one that spontaneously produces hats and shoes, garments and bread, ready for use.

Climate is virtually capital; not only in the easy production of animal, but vegetable food; for instance, the banana, which is estimated to yield 4000 pounds of nutriment on 1,076 square feet, enables a man to maintain a family, (as Humboldt affirms,) by working very moderately for

Mr. Norman mentions, in his interesting volume, "New Orleans and Environs," that in the Parish of Opelousas, La., "the inhabitants number their flocks and herds by thousands. On one estate 5000 calves were branded in the Spring of 1845."

two days in the week; the produce of this plant being 133 times more than that of wheat, and 44 times more than the yield of the potato, exceeding (as he supposes,) all plants upon the globe in the amount of food it produces on a given area.

In his travels upon the Orinoco, M. Humboldt says: "In those wild regions we are involuntarily reminded of the assertion of Linnæus, that the country of palm trees is the first abode of our species, and that man is essentially *palmiverous*." It may be true that the races in these *palmiverous* regions are not the most progressive. Climate is much—race more. The balmy air, and the spontaneous fruits of Paradise would probably fail to energize some races of the American continent.

The eternal war against the evils of a rigorous climate, having prolonged winters, consumes a large proportion of man's capital and labor, as completely as an annual conflagration. A long winter—a late spring—a cool, cloudy, wet summer, an untimely frost—an insufficient solar heat, wherewith to ripen many valuable kinds of grain and fruit—a climate that under the most favorable circumstances yields but a single crop, or that sometimes fails almost entirely to yield any crops at all, must render life precarious, threatened as it must be, in many cases, by famine, disease, and death. There is not any compensation whatever derived from the rigors of climate—great coldness is a great evil, and evil only. The best climate is that in which the greatest amount of the physical comforts can be obtained with the least labor—the least uncertainty, and the least anxiety. A pound of beet-sugar is no sweeter because it cost more labor in the making than a pound made from the sugar-cane. An ox-hide is not the less valuable for leather because it cost nothing but a charge of powder and lead.

The law of population developed by Malthus, namely: that population is kept down to the level of the means of subsistence by want and misery, recently exemplified in the decimation of Ireland, would not have been felt in a climate where the labor of two days in a week would suffice to provide for a family; nor in a climate where a million of unclaimed fat cattle is seen at a glance; nor in a climate where three crops of corn could be matured in one year. Climate, the potato-rot, and the consequent evils that befel Ireland in the ten last years, caused a decline of sixteen hundred and fifty nine thousand souls—equal to one-fifth of the whole nation—most of whom were as much the victims of climate as Sir John Franklin and his little party, whose fate still causes vibrations of sympathy throughout the civilized world. The last mails (Nov. 1851,) bring letters, showing that severe famine prevails in a part of the Scandinavian peninsula, where millions of human beings endure the rigors of a winter of nine months, and an incessant night of four months duration, illumined only by occasional corruscations of the *Aurora boreales*, which shoot above the snow-clad pines, and shimmer on the slopes of icy mountains.

The following statement has appeared in various journals:

CRIME OR STARVATION.—"Letters from Sweden speak of a frightful famine which has set in in the province of Womerland. The want is so great that the peasantry are forced to grind the bark of the birch tree, which they use in lieu of rye or wheat, in bread. With the increase of want, crime has already increased to a fearful extent; and robberies, which in that quiet and well disciplined country were known only by hear-say, are now of daily occurrence."

The remedy for long winters, uncertain crops, and impending starvation, is emigration to the genial plains of America.

Mr. Darby estimates the good land of the globe, excluding deserts, frozen tracts, and poor soils incapable of sustaining a tolerably dense population, at thirty millions of square miles. The valleys of the Mississippi and the Amazon, now comparatively wildernesses, contain about one-tenth, and by far the richer portions of the whole. Were the Mississippi valley as densely inhabited as England, it would contain two-thirds of the entire population of the world, and make New Orleans a greater city than the world has yet seen.

A city, to become permanently great, ought not only to be situated in a genial climate, but it ought to have the sea before it, gemmed with islands like Cuba and other West Indian Islands, and a thousand armed river behind it, reaching through a vast extent of latitude and longitude. It ought also to be situated in an alluvial plain, exuberant with food and the raw material for raiment. Babylon flourished on the alluvial plain of the Euphrates; Nineveh on the Tigris; Thebes, Memphis, and twenty-thousand cities and towns, on the Nile—rivers and plains incomparably inferior to the river and valley on which New Orleans stands. The Nilotic mud—not

the one-twentieth of the area of Louisiana, and probably much inferior to the alluvial plains of the Red River—a thousand years before Solomon reigned,* was adorned with palaces, temples, tombs and pyramids; the very ruins of which are to this day the wonders of the world, and sustained twelve (according to some authorities, twenty-seven) millions of souls, and, from its surplus, supplied other nations with bread. Sir J. G. Wilkinson, a reliable Egyptologist, says, from personal examination, that the whole of the arable land in the valley and delta of the Nile is but 2,200 square miles.

According to Herodotus, the oldest of the Greek historians, who wrote in the sixth century before Christ, the cities and villages of the Nilotic valley amounted to twenty thousand. Diodorus, a Greek historian who flourished in the fourth century of the Christian era, estimated the population of the valley between the first cataract and the sea, at eight millions. According to the late (1851) reseaches of M. Moreau de Jonnès, of the French Institute, the population of ancient Egypt was seven millions, forty-five years before the Christian era. Late reseaches show that Herodotus did not probably exaggerate the number of towns and cities in Egypt, for the names of no less than eighteen thousand of these have been found registered (as M. de Jonnès affirms) in the temples, averaging six to the square French league—a proportion three times greater than in France.

A fundamental advantage possessed by New Orleans over all other cities, consists in the superiority and extent of its river navigation. The Amazon is indeed vastly superior to the Mississippi in the volume of its waters, but its mouth—180 miles wide—is choked with more than a thousand islands, forming a maze of unnavigable currents. The Ganges wastes itself in a labyrinth of two hundred miles along the coast, and is navigable only a few hundred miles. The Indus, Euphrates, Nile, and most rivers, are, compared to the Mississippi, almost worthless, from cataracts, bars, islands, shoals, brevity, or other causes. The Thames, Loire, Po, Elbe, Vistula, Danube, Dneiper, Don and Volga united, fall short of the Mississippi nearly one-third in the volume of their waters.

During the greater portion of the year, the Mississippi affords a navigation equal to the circumference of the globe † two or three thousand times more than the Thames, the finest river in England (without which London would not have been the capitol of the world). The depth of the Mississippi on the bar at its outlet is only fourteen feet, (more, however, than double that on the bars of the Nile, Euphrates, Indus, etc;) fortunately it does not grow shallower, but, perhaps, deeper since first sounded by the discoverers of the country; for, according to De Pauget's survey, one hundred and thirty years since, the depth was only eleven feet. Within the bar, the depth, for many hundreds of miles, would probably average 100 feet, being more than double that depth at New Orleans. Ships of the largest class may, in most places, lie close to the bank—a fact that was noticed with surprise by the early navigators of its waters.

During the year 1850, Professor C. Forshey, A.M., Civil Engineer, whose acquaintance with the hydrography of the Mississippi is probably unsurpassed, remarked in a convention, that this river continues to be deep until it reaches the sea, or the great ridge called the bar, though divided as it is into many mouths, and almost unconfined by banks. Five miles from the sea, inland, it was found to be still 140 feet deep; that its current on the surface and at the bottom has nearly an equal velocity; that a lead or sounding line, 150 feet long, suspended from a skiff, and reaching nearly to the bottom, will hang perpendicularly while the vessel floats on the current: any artificial increase of the velocity of the vessel will cause an inclination of the line.

In a published communication, Professor F. says:—

“For many years the North-east Pass was the principal channel of commerce, and ships of fifteen or sixteen feet water passed the bar. Its depth now is about eight feet, and eleven feet is the greatest depth a vessel can carry over the bar, going out. Meantime, the South-west Pass has opened, and after several months of high-water cutting at the bar, a ship (the Columbia) was brought up over the bar, with nineteen feet of water. This is probably the greatest depth ever brought over against the current.

“Three or four years since, a cut-off was made by nature and the oystermen, twenty-five miles

* See Mr. Gliddon's able work on Ancient Egypt. Memphis, according to monumental evidence, was founded thirteen centuries before Solomon, and nearly twice as many B.C.

† There is, during high water, an immense extent of navigation in the cypress swamps and their bayous, not reckoned in this estimate. Timber is thus obtained in Louisiana perhaps easier than in any other part of the world.

above the Balize, discharging the water into the West Bay. In July, 1849, I measured and found the new pass, called Wilder's Bayou, 1500 feet wide, and sixty feet deep near the south shore. Since that time, the North-east pass has been closing with a new rapidity, and promise is given of a new channel to the Gulf."

Professor Drake, during his visit in 1844, sounded the river at New Orleans, where he found it 240 feet deep; while Captain Whiting, U.S.A., found it still deeper at the Barracks, three miles below the city. (Miss. Valley, i, 66.) Mr. Dimond has sounded the river repeatedly at and near Carrollton, during low water, in 1851, and has not found less than 176 feet.

GEOLOGICAL TABLEAU OF NEW ORLEANS.

Of all geological regions undisturbed by diluvial or volcanic agency, those of New Orleans and the vast plain on which it stands, appear to be the most important for determining several interesting problems in relation to the quiet action of fresh water formations, subterranean forests, successive elevations and depressions of the earth's surface, alluvial chronology, and alluvial palæontology. The geological data already extant, relating to the geology of the valley of the lower Mississippi, are not only sufficient for safe generalization, but they will serve to explain and connect many detached and illy-understood facts, scattered over the fields of this science; but the aims of this sketch are too limited to allow any formal attempts at generalization, except in a few points of view; and even here a rough outline must suffice instead of a finished tableau.

As all know, geologists agree in ascribing the changes which have taken place, and those now in progress, on the surface of the globe, to igneous, or to aqueous agents. The changes produced by volcanic action, being sudden and irregular, expose and often confuse the earth's strata. Hence the stratified rocks are dislocated, curved or tilted up, at every possible angle, from the horizontal to the vertical, bringing remote geological eras, so to speak, face to face. Granitic ridges or mountains thus elevated, take the places of the most recent rocks. For example, what a perplexing study is presented by the geological basin of Paris, after all the researches of Cuvier, and his successors. How many superposed, successive fresh water and marine formations, each at a different level, alternate with each other! How many difficult problems involved in the upraised and displaced fossil flora and fauna of the Parisian basin! The alluvial formation of New Orleans, is the resultant of the simple, regular, quiet, and long-continued action of water, unlike the sudden and disorganizing effects of volcanoes that have entombed the Herculaneum and Pompeii, and upheaved Iceland, Owhyhee, many parts of Mexico and of other countries, in confused strata.

It is hoped that the following facts will not be deemed tedious, since they are essential to a right understanding of the subject under consideration, and are, in themselves, of the highest interest, whether their interpretation be properly given on this occasion or not.

"In 1844," says Professor Drake, "I visited two gas tanks, each sixty feet in diameter and sixteen feet deep, recently sunk in the back part of the city, and received from the intelligent superintendent, Dr. Rogers, an account of what was met with in excavating them. At first, they encountered soil and soft river mud; then harder laminated blue alluvion; then deep black mould, resting on wet bluish quicksand. * * * The roots, and the basis or stumps, of no less than four successive growths of trees, apparently cypress, were found standing at different elevations. The first had a diameter of two feet six inches; the second of six feet, the third of four feet, and the fourth of twelve feet, at a short distance up, with a base of twenty-eight feet, for the roots. It was imbedded in a soft, deep-black mould. When cut with the spade, much of this wood resembled cheese in texture, but hardened on drying. This statement was confirmed by Mr. Kelvy, who conducted the excavation. At the depth of seven and sixteen feet, burnt-wood was met with. No shells, or bones of land animals, or fish, were observed; but in a tank previously excavated, at the depth of sixteen feet, the skeleton of a man was found. The cranium lay between the roots of a tree, and was in a tolerable preservation, but most of the other bones crumbled on pressure. A small *os ilium*, which I saw, indicated the male sex. A low and narrow forehead, moderate facial angle, and prominent, widely separated cheek-bones, seemed to prove it of the same race with our present Indians.—In these excavations, no fragments of rock or rolled pebbles were encountered. * * * Professor Riddell informs us, on the authority of M. W. Hoffman, Esq., that north of New Orleans, near Lake Pontchartrain, in the year

1828, Mr. Harvy Elkins bored to the depth of two hundred and seven feet. Thirty feet below the surface, fragments of Indian pottery were brought up, and part of a deer's horn, recent shells, and bones of land animals, were occasionally raised. The stratum in which the boring was stopped consisted of a hard, blue silicious clay. Brackish water, with volumes of some kind of gas, arose." (*Interior Valley, North America*, i, 76.)

A respectable member of the New Orleans bar informed me that a planter of undoubted veracity, on Berwick's Bay, thirty miles from the Gulf, near Franklin, having had a very large live oak, supposed to be the oldest in the country, which stood on the water's edge, and fearing it might fall suddenly, he cut it down. It proved to be hollow. He found under the roots of the tree, burnt wood, where a fire had once been made under the centre, and anterior to the growth of this ancient tree. A physician of New Orleans states, that in an attempt to get water near Lake Pontchartrain, by boring about 100 feet, pieces of cypress stumps, or wood, were brought up at intervals, together with fragments of pottery, as pipes; these have been often found in digging at various depths and places near New Orleans. In digging wells, cypress stumps are met with of great size, presenting difficulties in the operator's way. This is the first subterranean forest, and is from three to six feet deep, more or less, and is chiefly cypress, which appears to be most a durable kind of wood when submerged, or covered with earth. Had these subterranean stumps been suddenly and deeply covered by deposits and drifted alluvion, wood, &c., examples of which may be seen in the river bank, (where the old levee has been abraded and a new, natural one made in the rear, in a single season) not only the stumps, but a portion of the shafts of the trees, would have been found erect, and covered.

The lateral abrasion of the river bank during high water of the Mississippi, in many places, as well as upon the shore opposite the Second Municipality of New Orleans, below the town of Gretna, exposes, as if by a vertical section, the stumps of enormous cypress trees, numerous cypress knees, together with the stems of shrubs, standing erect exactly where they grew, on a horizontal line or common level. This range, which is seen during the low stage of the river, corresponds nearly with its present low water mark; it is found where the bank or natural levee is old, and upon that side of the river where there is more or less lateral abrasion, or no considerable accretion by recent deposits. These indications, together with large growing trees, particularly live oak, immediately on the bank, will guide the observer in his examinations. In fact, live oaks of large size on opposite sides of the river, near the banks, are reliable witnesses, showing that the river has not changed for many centuries. Thus it is easy to see that the river channel between Gretna and Lafayette has not changed materially for ages.

It will be proper to offer a few remarks in this place relating to the rapid alluvial actions which are, and have been, going forward within the limits of New Orleans, inasmuch as many persons regard these actions as harbingers of such a change in the river channel as will leave the city and the river distant from each other—a groundless fear, because the river at low water is but a few inches above the level of the sea; its current is, probably, in a great degree owing to the force from behind, (*vis a tergo*), acquired by gravity, or the falling down this inclined plane of regions more elevated. All that part of the volume of the water (more than two hundred feet) below the level of the sea, must be inoperative as a vertical abrading force, without which a new channel cannot be dug out. Hence, the largest crevasses fail to make a deep channel, or any channel at all; for as soon as the water falls through the levee, it is nearly on a level with the sea, and hence can have but a trifling vertical power. The force of a column of water depends wholly on its altitude, not on its width. The lower Mississippi can change its bed only by slow lateral abrasion, such as is now progressing in New Orleans. Many causes may contribute to accelerate lateral abrasions and deposits—an examination of which will show how these sudden, local, and sometimes very great changes may expose or cover cypress stumps upon the shores of the river.

At the upper border of the Second Municipality, a protruding land-point, fortified by wharves and lined with ships, directs the current towards the opposite shore at McDonough and Algiers, below which a still more salient point causes a rebound of the current towards the lower part of the First, and the whole of the Third Municipalities. Eddies exist in front of much of the Second Municipality. The angles of incidence with which the currents strike Algiers and the

Third Municipality shores, being the same, still the lateral abrasions will differ, for the New Orleans shore is defended by wharves built on piles. These wharves are carried out into the stream or batture more and more every year. These, with several tiers of ships along side, greatly defend the bank from abrasion, and, at the same time, retard the current. Whenever the current is retarded by eddies, or other causes, deposits are rapidly thrown down. The Medonough and Algiers shore is unprotected by wharves and ships. The river will gradually cut down the foundations of these towns, and at the same time extend the limits of the Second Municipality, at the rate of one square in ten or fifteen years. This ratio, based on the history of the last twenty or thirty years, will, however, doubtlessly decline with the increased obliquity, or rather straightening of the shore. The water which now rebounds from Algiers against the First and Third Municipalities, will cease to abrade their levees, protected as they are by wharves; then will commence deposits in front of these Municipalities, as in the Second, giving a linear, instead of a concave, crescent front to the city.

Before proceeding further, it may be necessary to remark, that the transporting power of the Mississippi is, as it probably always has been, extremely feeble, seeing that no boulders, pebbles, gravel, or even very coarse sands have been pushed down into the delta. From the summit of the levee to the lowest deeps of the river, the soil, when dry, crumbles into almost impalpable powder. The transporting power of the river is, therefore, at zero, as is, indeed, its velocity, notwithstanding the opinions to the contrary. Many of its tributaries flow, probably, from five to ten times faster; some bearing down coarse sands and fine gravel, others pebbles and angular rocks of various sizes.

The absence of pebbles and rocks in the delta, proves that its climate has probably never been much colder than at present, or the ice fields from the upper rivers would have transported these substances to this region, where, during the inundation, blocks of shore-ice, which often contain them, would have been drifted about, until melted, when these stones, that had been thus transported, would be deposited.

Having made these explanations, the subterranean forests demand attention.

The first stratum of subterranean cypress is from eleven to five feet below the present live oak level, and from two to four feet below the level of the growing cypress in the swamps in the rear of the levee, from ten to twelve feet below the high water mark, being nearly or quite on a level with a stratum of submerged cypress stumps of the largest size, which I have traced at low water mark, not only in the river bank, but also in the Bayou St. John, towards the lake, north of, and some miles from New Orleans. There can be no doubt that this is identical, or continuous with the stratum at the low water mark of the river, and with the first range found in excavating the Gas Works, the New Orleans canal, wells, &c.

The Gas-works are about a mile from the levee, upon the inner margin of the cypress zone, which extends five or six miles farther to the lake. The platform upon which these works stand, is laid off into streets for nearly a mile in the rear. This district has a few scattering houses, numerous ditches and canals, with innumerable cypress stumps, of enormous size, closely set, measuring, sometimes, when cut off on a level with the ground, at least forty feet in circumference; some of these have been cut perpendicularly through in ditching, so that the same stump forms the banks on each side of the ditch. In some recent excavations extending considerably below the level of the New Orleans canal and Lake Pontchartrain, old stumps of large size, seated in a blueish clay, were observed; indications to the same effect were met with in the canals. This cypress formation, appears to be among the oldest in the delta, and has every appearance of having had several generations of trees. Bearing these facts in mind, let us return to the river, where there is another, or second stratum of cypress stumps found at low water mark, which swimmers can touch with their feet when they visit the shores where there is slight abrasion, no accretion, a proper slope, and an ancient levee. In a bank loaded with recent deposits this range is, of course, not to be found. But in the proper places, where the abrasion is moderate, the shafts of the trees rise up to, and even above the water, the stumps being submerged. There is another stratum, probably cypress, indicated by straggling stumps, about mid-way between high and low water marks; but this not having been fully examined and established, I omit altogether.

It must not be forgotten that the live oak groups and the two cypress groups—the one at low water mark, and the other submerged—are really superposed or vertical; the first being over the second, and the second over the third; although this never is seen literally, unless in banks which are perpendicular; which are, however, sometimes witnessed when they are about to cave into the stream. Hence none of these groups, as seen on the slope of the batture, seem to be directly over the other, when the section is not a perpendicular one.

The following interesting data are taken from a report on the Cypress Timber of the States of Mississippi and Louisiana, read before the Association of American Geologists and Naturalists, at the eighth annual meeting, in Boston, by M. W. Dickeson, M.D., and A. Brown, A.M., (page 8, 1848):

“Sections of such filled up cypress basins are not unfrequently exposed by the changes in the position of the river; they exhibit undisturbed, perfect and erect cypress stumps, in a series of every elevation with respect to each other, extending from high-water mark down to at least twenty-five feet below; measuring out a time when not less than ten fully matured cypress growths must have succeeded each other. There are also instances where prostrate trunks, of huge dimensions, are found imbedded in the clay, immediately over which are erect stumps and trees, numbering no less than eight hundred concentric layers.

“One specimen, somewhat over seventeen inches, was found to contain three hundred and eighty annual layers, varying in thickness from the 1-120th part to the 1-4th of an inch. In a tree of not more than forty-two inches, we counted over sixteen hundred rings of growth: they decreased in thickness on receding from the centre, until one inch contained not less than ninety-five. From all this it may be presumed that there are cypress trees in the forests numbering over two thousand years.”

In twelve trees of moderate size, I obtained an average of 30 years to an inch, ranging from nine to sixty. These trees were only from twenty to thirty inches in diameter. For a short distance around the heart, the ligneous rings are often less crowded than nearer the circumference. The ratio of growth, in the same tree, sometimes differs at irregular intervals of a few years or centuries, in any part of its diameter. On the whole, the annual growth of the cypress is slow, and comparatively uniform. Measurements will give a satisfactory degree of approximative certainty. The ligneous rings of the live oak are so blended with the cambium (or cellular saps-tissue) that it is difficult to detect them, while the cypress presents, in this respect, no difficulty whatever, being exceedingly distinct. Hence, Messrs. Dickeson and Brown were enabled to detect 95 to 120 rings in a single inch. The former, not the greater number, therefore, will be assumed as the maximum ratio of the oldest trees,—to which reference will be made in the sequel.

It is remarkable that these scientific gentlemen virtually repel the conclusions to which their facts irresistibly lead, as they sum up by saying, “that it is four thousand years since the first cypress flourished.” “The cypress,” say they, “towers 120 feet without a limb, with a circumference at top often exceeding 16 feet, and at butt more than 20 feet, and this above the usual swell near the base.” Now, a single tree of this size gives an age of 4,180! Of this, more hereafter.

The age of trees—a singularly interesting and much neglected branch of natural history—demands attention before proceeding further. While coins, medals, manuscripts and monumental inscriptions may mislead the antiquarian and chronologist, trees, the living historians of nature, record truth only, and the most prejudiced must at once assent to their claims as credible witnesses.

The following data, taken from Humboldt, De Candolle, Mrs. Somerville, (Physical Geography,) the Rev. Mr. Milner, (Gallery of Nature,) and other works, show that trees have attained a greater age than what our received chronology assigns to the world itself, namely, 6,000 years. Yew trees are known to be 2,280 to 3,000; limes, 1,114; oaks, 1,500 to 2,000; a yew tree in Kent, 3,000; taxodiams, or cypresses, 4,000 to 6,000; baobabs, (*adansonia digitata*), in Senegal, 5,150; Sycamores, on the Bosphorus, 4,000. Mrs. Somerville says: “The yew tree, according to M. De Candolle, increases in girth the twelfth of an inch in a year, during the first 150 years, and rather less in the next hundred; the increase probably diminishing progressively. The cypress rivals the yew tree in longevity, and may, perhaps, surpass it. The *adansonia digitata*, in Senegal, was proved to be 5,150; yet Baron Humboldt considers a cypress in the garden of Chapultepec [Mexico] to be still older.”

The following views are taken from Humboldt's last work:—*Views of Nature*.—De Candolle says the yew tree (*Taxus bacata*) attains the age of 3000. M. Humboldt mentions a cypress of Santa Maria del Tule, in the State of Oaxaca, Mexico, which had been reckoned sixty feet, but which he found to be exactly 40 1-2 feet in diameter. Banyan trees are of thirty feet in thickness. An oak at Saintes, on the road to Cozes, in the Department de la Charente Inferieure, France, is 1800 or 2000 years old. A rose tree, (*Rosa Canina*), which grows in the crypt of the cathedral of Hildesheim, now 27 feet high, and but two inches thick, of great renown in Germany, is proved by the most authentic records to be eight hundred years old. Perrottet and Adason examined Adansonias from 5000 to 6000 years old. Various trees have been measured which give as their circumferences 32, 60, 75, and 112 feet. Cypresses in Mexico rise to 128, having diameters of 30 to 40 feet.

The yews, adansonias, and banyans differ but little in height from the live oaks. The adansonias is represented as being a very perishable kind of wood.

A block taken from a growing live oak, in Live Oak square, Lafayette, adjoining New Orleans, having been measured, and its ratio of annual growth ascertained, the circumference, and, from that, the semi-diameter of the tree having been determined, the age of the tree proved to be 518 years. Below the town of Gretna, opposite Lafayette and the Second Municipality of New Orleans, upon the natural, a few feet from the artificial levee, 30 or 40 inches below high water mark, stands a live oak, which, in its smallest circumference, before it extends into branches, is 16 feet, having, according to the data mentioned, an age of nearly five and a half centuries. Now, be it remembered, that just opposite this tree, within the levee and batture, may be seen the remains of the two subterranean cypress forests at low water—the first at the water's edge, about eight or nine feet below the live oak platform—the other submerged. Artificial sections could not be more conclusive, as it regards superposition.

Omitting, for the present, the further consideration of the age of trees, and of the delta, additional illustrations of the alluvial formation of the latter, and the natural history of the former, will be given.

LIVING GROUP OF TREES.

Ist. The live oak (*quercus vivens*) makes the most elevated platform. This perennial-leaved tree, like most others whose longevity is very extended, scarcely rises above the ordinary height of a house. Repelled by the cold from the Northern part of the State, it becomes the type of the elevated alluvion in the latitude of New Orleans, being intolerant of prolonged inundation, having for its associates many kindred ties, as pecan, sycamore, magnolia, elm, honey locust, various species of oak, hickory, sweet gum, poplar, hackberry, ash, canes, &c. Although the live oak is sometimes wholly absent in certain localities, it has equivalent groups representing its *habitat*. There is sometimes considerable confusion, or rather commingling of groups, as may be seen in the delta of Pearl river, which lies to the east of New Orleans, and to the north of the Rigolets and Lake Borgne, a region checkered by many deep bayous, having on its seaward aspect, as far as the eye can reach, vast expansions of colossal *Graminea*, chiefly the perennial reed grass, (*phragmites communis*) twenty feet high, being nearly impenetrable to man, beast, boat, and alligator. Forty or fifty miles inland, where I crossed the delta, following the telegraphic wires seven miles without seeing a house, I observed in this low plain or basin, a blending of all the groups according to the ranging levels and elevations, trees and plants mixed, as oaks, sweet gum, hickory, magnolias, &c; also, cane-brakes (*macroserma gigantea*) from 30 to 40 feet high, so closely set that neither man, bear,* wild hog, nor alligator can penetrate them. These trees are large, tall, and present a foliage so dense as almost to intercept the rays of the sun, making a deep shade. The shores of the bayous, and of east and west Pearl rivers, in many places, present banky masses of wild flowers down to the water's edge, "Wasting their fragrance on the desert air."

The second living group in the descending scale, consists of various trees and plants, intermediate between the live-oak and aquatic belt, the best type of which is the cypress, (*cyprinus disticha*), the most gigantic, symmetrical, and useful tree of the South, rising from 100 to 130

* Within hearing of the night guns of New Orleans, in this delta, bears are probably more numerous than in any settled portion of the United States. They prey chiefly on wild hogs.

feet without a limb, straight as an arrow, having a perennial foliage and few limbs, which expand at its summit, appearing at a distance tufted and usually festooned with that most singular of all parasites, the long, gray, pendent moss. The summit of a cypress forest appears in the distant horizon almost as level as the sea. These trees, in a great degree, displace all others in such low formations as are sufficiently wet and inundated almost every year. Lands perpetually dry, or deeply and constantly inundated, repel these trees. On the lower border of the cypress basin, the perennial dwarf palms, (*chamærops humilis*,) abound, resembling colossal fans planted in the ground; while, upon higher ground, dense, lofty and impenetrable cane-brakes contend for the possession; the cypress being thinner, but not less elevated; the whole forming the most striking tableaux of floral grandeur and wild exuberance that I have ever seen within or without the tropics.

The third living group consists of colossal reed-grass, aquatic plants, floating or trembling prairies, &c. But for the present, this group will be omitted, and will be replaced by the first group in this series; or the

SUBTERRANEAN, OR DEAD GROUPS OF TREES.

This third grand group is the first subterranean formation, consisting of stumps, shrubs, cypress knees, &c., exposed at the low-water mark of the river and the Bayou St. John, &c., being identical with the first range found in excavating canals, and the Gas-works, as above described.

The fourth subterranean group is represented by the submerged group discoverable at the low-water mark of the river, corresponding to the second found in the Gas-works. The fifth and the sixth are found in the Gas-works, and elsewhere; to these must be added six of the ten subterranean groups reported by Messrs. Dickeson and Brown, at higher points of the river, making twelve groups, each of which, as in the descending series, stands at a lower level and beneath the other.

Now the fundamental type of all these discovered, and of perhaps fifty undiscovered, but, nevertheless, probable formations, is found in the third group, namely: that at the low-water mark of the river, Bayou St. John, &c., which is, indeed, very satisfactory; the stumps being numerous, large, and on a common level, at all distances that have been examined within and beyond, the limits of the parish of Orleans, while Messrs. Dickeson and Brown have found ten similar strata, hundreds of miles above, as far as the State of Mississippi, as already detailed.

Those curious, woody, branchless, coniferous exostoses, arising from the cypress roots, called cypress knees, are found in the sunken, as well as in the living forest, standing erect where they grew, showing that they could not have been in any way subjected to, or transported by, diluvial currents.

Having established the horizontality or levelness of three cypress forests, not to name the live oak, there can be no manner of doubt that the other three which have not been so fully exposed are equally level; in fact, they are in superposed and successive ranges, though perhaps each may stand upon a plane, having a slight inclination, corresponding to fluviatile strata or depositions.

THE LAST EMERGENCE OF THE SITE OF NEW ORLEANS.

The recent elevation of the platform of New Orleans may be divided into three eras, as already noticed, namely: 1st., the era of colossal grasses, aquatic plants, trembling prairies, &c., occupying a district on the lagoons, lakes, and sea-coast, of variable width—from a few rods to 20 or 30 miles; 2nd, the era of the cypress basins; and 3rd, the era of the live oak platform. Existing types from the Balize to the highlands, show that these belts were successively developed from the water, the grass preceding the cypress, the cypress the live oak.

In the long past, unrecorded ages, a boundless expanse of turbid water began to be, at the site of New Orleans, dotted with mud-banks, bearing grasses, stranded trees, wading birds and sluggish crocodiles. The detrital deposits, from the table lands, hills and mountains throughout the great valley, held in suspension by the annual flood, tended to build up a foundation for each floral platform, as already enumerated. The lapse of time required for the accomplishment of this work of elevation, must have been enormous. M. Humboldt says; "that all sea-coasts afford

evidence of the hundreds, or even thousands of years, which must pass before the moving sand can yield a firm basis for the roots of herbaceous plants." An inscription on a Nilometer, first mentioned by Strabo, now known, furnishes monumental evidence as reliable, as it is rare, illustrating the action and progress of detrital deposits during seventeen centuries, from which it appears, that during this long period an elevation of seven feet has taken place, affording an average rise of nearly five inches in a century. At Elephantine, the land had been raised nine, at Thebes, seven feet, but there was a great and constant decline to the mouth of the river at Possetta.* The Mississippi is constantly advancing the land into the Gulf of Mexico. Elevation is everywhere taking place. Lakes Maurepas and Pontchartrain, constituting the little Mediterranean of Louisiana, are filling up with deposits—grasses, aquatic plants, and marine exuvia, which will finally change these lakes to lagoons—lagoons to prairies—prairies to cypress swamps, and cypress swamps to dry land, to be traversed by a deep, sluggish river, consisting of the united waters of this Amite, Tickfau Tangipahoa, Pearl River, and the Rigolets.

When these and a hundred other lakes shall approach the elevation which characterizes dry land, the cypress will be displaced, to reappear on the littoral of the State.

The period occupied by the last gradual emergence of the site of the New Orleans platform, cannot be accurately determined. That it is vast, is demonstrable.

The elevation of the grass-zone to the condition of a cypress basin, will be assumed to have occupied 1,500 years; corresponding nearly with the known elevation of the Nilotic valley.

The existence of two consecutive generations of cypress will be assumed to have existed in the delta, counting the one now growing: to suppose less, would be absurd. The age of the cypress becomes an important part of this inquiry:—What is maximum age?—the very oldest of each generation. The cypress measured by Humboldt at Tule, in Mexico, being 40 1-2 feet in diameter, gives for its semi-diameter, 253 inches; which, multiplied by 95 ligenous rings in the inch, gives 24,036 years as the age of one generation of living trees; an age not yet complete! Assuming that one generation of trees preceded the present, the two ages amount to 48,072 years. M. Humboldt says that "the cypresses of Mexico rise 128 feet, and measure 30 or 40 feet in diameter."

Messrs. Dickeson and Brown say that in one specimen, somewhat over 17 inches in diameter, was found 380 annual layers. "In a tree of not more than 42 inches, we calculated over 1,600 years of growth. Let it be observed that these data relate to the semi-diameters; the former being 8 1-2, the latter 21 inches.

I have this day (November 10, 1851) examined a cypress plank in the lumber yard of Messrs. Day & Co., made of a tree from the Yazoo swamp, the semi-diameter of which is 27 1-2 inches. This tree has grown much more rapidly than many others, and with uniformity, except in a very few places. The smallest number of annual growths to an inch was 19; the greatest number, 52. Four other places, all distant from each other, each measuring an inch, gave the following numbers of rings: 22, 23, 26, 25. The average of the six observations from the centre to the circumference, was 28 rings to an inch; making the tree 740 years old. Now, this is comparatively a young tree. Messrs. Dickeson and Brown say† that "the position and condition of the cypress timber are usually such as to prevent the possibility of obtaining the timber except by floating it out of the swamps during seasons of overflow. Its specific gravity is often such as to render that mode impracticable, it varying from .7 to 1.2: the usual specific gravity is about .9. Hence the greater portion, whose gravity is above that of water, must of necessity be left in the forests to waste and decay. The largest and smallest are usually left in the forest, one-third being of greater gravity than water. As it is of very slow growth, the day cannot be very distant when it will altogether fail to furnish a supply, etc." My examinations have been wholly confined to those small trees floated out of the swamps, the most unfavorable class for getting the greatest number of rings in the smallest space. Yet some of these give 60 to the inch. Messrs. Dickeson and Brown observed in some specimens *twice that number*.

I will assume as a fact, that the platform of New Orleans, or the delta, has no cypress tree ex-

(*Sir J. G. Wilkinson's Egypt.

†This report, emanating from an able special committee, appointed a year before the annual meeting at which it was read, having been published by the Scientific Association, is of a reliable character. Hence it is referred to repeatedly for its facts not for its conclusions, in chronological geology.

ceeding 10 feet in diameter ; although this is probably too low an estimate for the largest existing tree, being not the one-fourth as large as the cypresses measured by M. Humboldt in Mexico, but nearly corresponding with the stump mentioned by Professor Drake as found in the lowest range in the Gas-works excavation. A tree 10 feet in diameter will have 5 feet, or 60 inches for its semi-diameter. As Messrs. Dickeson and Brown have found from 120 to 95 growths in an inch, I will take the latter as the maximum. Ninety-five times sixty gives a total of 5,700 years for the oldest tree now growing. While many generations of such trees may have grown and perished in the cypress region, the limit will be fixed at two only, making the ages of two generations, 11,400 years.

The maximum age of the oldest live oak, or the oldest tree met with in the live oak platform, will be estimated at 1,500 years, admitting only *one* generation—which is the smallest possible reduction.

These data indicate as probable, the following

GEOLOGICAL CHRONOLOGY OF THE LAST EMERGENCE OF THE PLATFORM OF NEW ORLEANS.

	YEARS.
Era of aquatic plants	1,500 ;
Era of the cypress basin	11,400 ;
Era of the live oak platform	1,500 ;
Total period of elevation	14,400.

None of the subterranean forests appear to have had a superposed live oak platform, as no oak stumps have been observed. Moreover, the depth between the level of the living live oaks and the first range of subterranean stumps laid bare by the river, at low water, is more than the double of that noticed between the sunken forests. Hence, the live oak age ought to be deducted from the latter. But it must be remembered that each of these forests had a period of quiet, gradual, depression. It is a matter of no importance whether this sinking can be accounted for or not : it is with the fact only that we must deal. From the regular levels of these sunken forests, it is evident that the sinking was gradual. From numerous data, observed in modern times, showing the steady subsidence of some districts, and the rise of others, it is evident that this process is extremely slow, and not at all perceptible to the careless observer. If, therefore, 1,500 years be allowed for each era of depression, the living and dead groups of trees will have extended over equal periods of time.

Messrs. Dickeson and Brown, in the upper regions of Louisiana, and in Mississippi State, where the range between the high-water and low-water marks of the river is nearly double that seen at New Orleans, have examined “ten fully matured cypress growths, which must have succeeded each other, exhibiting undisturbed, perfect, erect stumps, as exposed by changes in the position of the river,” also, “huge trunks, immediately over which are erect stumps and trees.

The sunken forests of New Orleans, being a part of a series of ten reported by Messrs. Dickeson and Brown, will give the following results :

	YEARS.
Last emergence as above	14,400 ;
Ten elevations and depressions, } each equal to last emergence }	144,000 ;
Total age of the delta	158,400.

These facts prove that the relative levels of the Gulf of Mexico, of the river, and of the delta, have undergone great changes ; that the remains of numerous subterranean forests, each occupying its own proper level ; the upper stratum having at intervals underlying strata ; that each group-platform was gradually elevated by fresh-water deposits ; that each group having remained above the water for an undefined, but very long period, then was submerged by either fresh or salt water, killing the forests ; that the deposit, as far as examined, indicates a fluvatile formation, and not marine alluvium, as sand, shells, &c. ; that the proofs of depression and elevation, undisturbed by violent action, are, in this delta, much more satisfactory than any yet

adduced; that the bones of man, works of art, burnt wood, &c., found under these strata of sunken forests, prove that man existed at an era far more remote from the present, than any other historical, monumental, or geological evidence extant.

Reliable geologists maintain that the oceanic and land levels of several countries are changing. While the land upon one coast is constantly sinking, that of another is constantly rising. The proof, however, is by no means very clear, particularly that which is most relied on, namely, submarine forests, the remains of which are sometimes brought up by the anchors of ships, &c. Professor Hitchcock, in his elaborate official report on the geology of Massachusetts, says: "Geologists are not a little perplexed satisfactorily to account for submarine forests. In general it has been supposed that these forests have subsided in consequence of earthquakes, or other internal movements of the earth. I suspect that observers have too readily admitted that these forests occupy the very spot where they grew, and that more careful examination would show that they have been drifted from a higher level to their present situation;" (308.) Now this explanation is entirely inapplicable to the subterranean forests of New Orleans, the geology of which must henceforth be conclusive, as to the successive depressions and elevations of the earth's crust; and also conclusive in favor of the great antiquity of the flora and fauna of the delta. It is true that in all lands, wood, plants, peat, bones, and fossils have been found underlying or mixed up with rocks, indicating diluvial and volcanic action, or the prolonged actions of water in the deposition of the stratified fossiliferous rocks—the one class of agents acting instantaneously, the other during interminable periods, both leaving their autographs, if not histories—while alluvial and forest formations write their autobiography. No one can tell whether the new fossil fishes, (*PTERICHTHYS MILLERI*—*Agassiz*.) discovered in the old red sand stone by the eloquent and learned stone-mason of Scotland, Hugh Miller,* lived ten thousand or ten millions of years ago.

Here a few words of explanation may be necessary on geological and historical chronology. The Mosaic history of the creation is illustrated—I will not say confirmed, since it needs no confirmation by geology, inasmuch as the fossil flora and fauna discovered by the latter, follow the order of, and coincide with, the former. The sacred writings, however, do not specially teach the science of chronology and the regulation of the calendar, any more than they teach physics, astronomy, political economy, or the chemistry of gunpowder, steam, electric telegraphs, &c. Not a few of the most conservative theologians and laymen, skilled alike in Hebrew and geology, agree that the word rendered *DAY* in its applications to the epochs of creation, means not literally twenty-four hours, but a period of *undefined duration*. Indeed the sun, the measurer of the literal day, was not created until the fourth epoch or day of the creation.

Several writers have endeavored to fix the chronological era of the delta of the Mississippi by the ratio of its depositions, or the time required to elevate the land to its present level—a period, according to Sir C. Lyell, of 60,000 years, or, according to Professor Forshey, 13,684, estimating the average depth of the alluvion at fifty feet. The former gentleman estimates the depth as being ten or twelve times greater. The depth is unknown. Other things being equal, a deposit of 1000 vertical feet would require a period twenty times longer than one of fifty feet.

This outlined tableau of the geology of New Orleans combines with the most recent, the most ancient features of the newest of all geological formations, namely: the alluvial—that is now in progress. It may be objected that the great antiquity of the flora and cotemporaneous fauna of the delta, as estimated in the preceding pages, is not confirmed by, but opposed to traditional, historical, monumental evidence,—that the creation of the world took place, according to Usher, 5,885 years ago, and that, in the language of the Rev. Dr. Buckland, (author of the *Bridgewater Treatise on Geology*.) "no conclusion is more fully established, than the important fact of the total absence of any vestiges of the human species throughout the entire series of geological formations."

In all things whatever, the claims of a divine revelation are paramount, definitive, final; its dicta are facts demanding credence, presenting the surest, safest, shortest, and most scientific route to certainty; if it has fixed the era of creation as being 5,885 years ago, then it must be

* This gentleman's prose is the poetry of rocks—a hymn to the Creator. The greatest geologists are the most astonished at the mason, as Agassiz, Buckland, &c.

admitted that the same Power that created all things, created the different sunken forests of Louisiana, as stumps, cypress knees, and fallen trees, in regular strata; that he put the bones of land animals, pieces of pottery, pipes, burnt wood, and the skeleton of an Indian, between these strata; that he raised the delta to the condition fit for the present cypress trees, some of which are now as old a creation, (say trees 10 feet in diameter,) while other trees were created 30 feet in diameter, having about 17,200 annual growths; and that the entire fossil flora and fauna, from the highest geological formations down to the lowest fossiliferous groups, were created at the same instant, with the stratified rocks in which they are found imbedded. But, as has been already said, revelation does not teach chronology—does not fix the historical eras of the world—nor even the duration of the days or epochs of the creation itself; indeed, the Christian Revelation expressly declares, that with the Creator “one day is as a thousand years, and a thousand years as one day.”

The article Chronology, in that colossal work of British genius, the Encyclopædia Britannica, (last edition, 1842,) enumerates the results of the researches of no less than 34 of the ablest chronologers who have written with the view of determining the number of years that have elapsed from the Adamic to the Christian era; one says, 6,934; another, 3,616, from the whole, the following conclusion is drawn, namely: “All that can be inferred from these conflicting statements amounts to this, that the true epoch of the creation of the world is utterly unknown.”

It may be objected that the human skeleton found in the excavation above mentioned may have been buried as the Caucasian race bury the dead, in an excavated grave. This is improbable, as the burnt wood found at the same level and place, will prove, as well as the skeleton, the contemporaneousness of man. But to avoid cavil, the geological chronology of the fourth subterranean forest will be omitted, in order to reduce the chronology to the smallest possible limit.

Living group,	- - - - -	Years	14,400;
Three subterranean groups, each equal to the living,	- - - - -		43,200;
Total,	- - - - -		<u>57,600.</u>

From these data it appears that the human race existed in the delta more than fifty-seven thousand years ago, and that ten subterranean forests, and the one now growing, will show that an exuberant flora existed in Louisiana, more than one hundred thousand years anterior to these evidences of man's existence. A hundred and fifty thousand years ago, as now, the Mississippi laved the magnificent cypress forest, with its turbid waters! How little do the palaces of the Cæsars or the pyramids of the Pharaohs, deserve to be called “eternal,” compared with the cypresses mentioned by Humboldt.

TABLEAU OF THE NECKROPOLIS OF NEW ORLEANS.

In the year 1840 I ascertained, by careful inspection, the ages of a great number of persons buried in the cemeteries of New Orleans, copied from monumental inscriptions, taken at random, that is, without picking or selection, in series of thirty each. The numerical results of this inquiry, in the absence of more authentic registries of births, deaths and ages, may be valuable in determining approximatively the duration of life, and the sanitary history of the climate of New Orleans. The neurological inscriptions in the different cemeteries of this city are not only illustrative of its vital history and sanitary perturbations, but are also, to a considerable extent, characteristic and peculiar.

The ideal of vital statistics, as a method, presents sundry conceptions as absolutely true, in advance of empirical processes, and their actual results in relation to both the statics and dynamics of population. But how clear soever the theoretical principle may be, its useful application is alone to be found in the experimental.

For scientific purposes, the facts of vital research and reasoning must be numerous, continuous, and must extend through long cycles of time. The most accurate record, comprehending the history of every individual in existence for one year, or one dozen of years, would utterly fail to solve some of the most important vital problems, which, anterior to experience and its results, are known to be solvable, and within the legitimate range of empirical possibility. Synthetical reasoning determines, in advance of experience, that the mean duration of life in a country can

be inferred from a record of the ages of all the natives dying within its limits. The record of one entire generation would not only show the exact duration of the mean life for that period, but in connection with a sufficient number of similar previous records, would indicate, with slight and unimportant variations, the mean duration and expectation of life for succeeding generations. In the science of population, however, a generation commencing at a given era, would not be complete as a vital cycle until the last individual then living shall die. For example, an individual born in 1851 might not die until 2,020, provided he should live as long as Henry Jenkins did—that is, 169 years. A registry of an entire generation will have been completed at the death of the oldest individual. The sum of all the ages of a given generation, divided by the whole number of individuals, will give the mean age.

Without any regard to the actual census, suppose the fixed creole and acclimated population of New Orleans to be 100,000, and that immigration and emigration be wholly arrested;—suppose four children to be born and four persons to die annually for every one hundred inhabitants; then the population will be stationary, without increase or decrease, and how much soever individual ages may differ, the average life will be twenty-five years. But in case only two die in the hundred, the births undiminished, the population will increase annually two in the hundred, or for the city two thousand; the whole number of births will be four thousand, and the whole number of deaths two thousand; then the average life will be double—will be fifty instead of twenty-five years. Suppose that during the year 100,000 persons come temporarily into the city, and lose two in every hundred, all the survivors returning home, then the deaths and births will be equal, the average life will seem to be reduced to twenty-five, and the increase neutralised; all of these conclusions would be necessarily false, for want of correct data, comprehending all the essential elements entering into the numerical process, static and dynamic.

Although four births and four deaths annually for every one hundred persons would cause the population to be stationary, and the mean life to be twenty-five, yet, with respect to the latter, a single year might give a result altogether different; and so of a very limited number of years; thus, one dying aged one hundred, another fifty, a third twenty, and a fourth ten, the average might be double that which has been named. But in a period sufficiently prolonged, such excesses would be reduced or equalized. In tossing a dollar in the air the same side might fall uppermost for several consecutive times; but if the operation be continued sufficiently long, this marked inequality disappears forever. The same principle prevails in vital statistics, as well as in numerical medicine.

There are, indeed, a great many elementary questions which it is desirable or necessary to consider, in order to arrive at satisfactory conclusions concerning the vital condition of New Orleans.

What is the annual mean number of the resident creole and acclimated population? What is the annual mean number of strangers, and time of their temporary residence? What is the mean number of births, deaths and ages of each class, not to mention internal and external relations, topographical, ethnographical, physiological, sanitary, industrial, pecuniary, educational, moral, religious, social, civil, in the white, black, red, and mixed races?

By the general custom of mankind—one not only in accordance with good taste, but with sanitary requirements—the dead are consigned to the ground—“earth to earth;” but in New Orleans a different method of sepulture prevails. In most of the cemeteries, interment in the ground is wholly interdicted, elevated vaults and tombs only being used. The necessity of this method of entombment, for all who can afford the expense, is easily explained by referring to the topography of the city. A grave in any of the cemeteries is lower than the adjacent swamps, and from ten to fifteen feet lower than the level of the river, so that it fills speedily with water, requiring to be bailed out before it is fit to receive the coffin, while during heavy rains it is subject to complete inundation. The great Bayou Cemetery is sometimes so completely inundated that inhumation becomes impossible until after the subsidence of the water; the dead bodies accumulating in the meanwhile. I have watched the bailing out of the grave, the floating of the coffin, and have heard the friends of the deceased deplore this mode of interment. A young Irish woman, on seeing her husband’s coffin lowered into a grave of welling water, exclaimed repeatedly: “Oh, Mike, it is a dear burying to you to be buried at the Bayou! Oh that you should come to

this!" It is this feeling that has built the different cemeteries which constitute the great necropolis of New Orleans. Interest, to say nothing of the vanity of friends, requires inscriptions to identify a vault, which is private property, purchased under a written title or conveyance. Hence, these monumental inscriptions, from their constancy, accuracy and number, afford data which, in the absence of exact registries, are probably more trustworthy and valuable than can be found in any other existing necropolis. These necrological monuments will augment from generation to generation, and must hereafter prove more useful to the vital historian than the pyramids of Egypt, or the countless millions so carefully embalmed and deposited in the catacombs of that country, forty centuries ago. The ethnologist might even now commence his lesson among the tombs. The Caucasian is separated from the negro race. In some cemeteries the Irish, in some the German, in some the Anglo-American, in some the French type predominates.

The monumental evidence to be offered in this tableau, in relation to the salubrity of the city and the length of life, compared with other places, is doubtlessly imperfect. The principal objection to which it is liable, appears to be this; namely, very young children may not have had inscriptions on their vaults, as constantly as adults; though this hypothesis may be incorrect. But admitting that it is true, this source of error is neutralized, it may be supposed, by an undeniable fact, that in all the cemeteries, even those which reflect the creole life most truly, as the Catholic, strangers, victims to the climate, who "lived not half their days," are buried, and being counted, tend to shorten the average life probably as much as the supposed omission of infantile inscriptions tends to enhance it. The evidence, upon the whole, if not demonstrative possesses probability, and is offered for what it is worth, in the absence of more exact data.

In the following enumerations, fractional parts of a year are reckoned as one year when they exceed six months, or fall short of eighteen months, and so of all fractions in more advanced ages. In all cases it was deemed necessary, in recording a series of ages, not to reject any because they were short, nor to seek any because they were long. Thus, on one occasion, having completed the series for the time and the place, I came immediately to an inscription upon a well known negress, aged 107 years and 5 months, born in 1732, died in 1839, but the rule adopted excluded this, as well as other similar cases. In Lafayette cemetery, as the sexton informed me, there is a negress slave buried aged 110. A similar age was found in the Catholic cemetery, after having finished the series. But all these were omitted.

The old Catholic cemetery, (No. 1, Basin street,) in which nearly all the inscriptions are French, 13 only were distributed among all other languages, gave the following results, after having made 136 observations:

The first series	of	30 observations	gave an aggregate of	1474	years
The second	-	30	-	1512	-
The third	-	30	-	1381	-
The fourth	-	30	-	1313	-
The fifth	-	16	-	852	-
Total observations, 136.				Total ages,	6537:

mean life 48 years and a fraction: more than 21 years over the mean of the Hebrew cemetery—20 1-4 over that of the Bayou; 17 1-4 over that of the Protestant;—27 1-3 over that of Lafayette city;—12 over that of all France;—nearly 20 over that of the department of the Seine, (Paris)—and about 22 years beyond the mean of the old Protestant cemetery immediately adjacent. The following table shows the mean age, with the three oldest persons in each series, in this cemetery:

SERIES.	MEAN AGE.	THREE OLDEST IN EACH SERIES.			MEAN AGE OF THREE OLDEST.
1st. series	49.01	81	80	76	79
2nd. -	50.56	76	76	74	75.33
3rd. -	46.03	85	80	78	81
4th. -	43.76	85	81	72	79.33
5th. -	53.25	92	90	90	90.66

Although the place of nativity is not always mentioned in these inscriptions, yet out of Louisiana the United States furnished but 1, and Ireland but 1, France 19, and Spain, Genoa and St. Domingo, each 4. The prevailing type, in this cemetery, is doubtlessly the creole French.

The old Protestant cemetery, (adjoining the Catholic cemetery on Basin street) long abandoned as a place of burial, gave for 30 inscriptions an aggregate of 797 years, and a mean life of nearly 26 1-2 years—the 3 oldest, 62, 60, 47.

The new, and by far the most extensive of the Catholic cemeteries, is that in the rear of the former, consisting of four squares, between Robertson and Claiborne streets, the southern portion of which is for the colored race. In this cemetery, especially in its northern portion, French inscriptions preponderate. The white race, in 80 observations, afforded the following results: The first 30 gave an aggregate of 1296, and a mean of 42.2 years—the 3 oldest 89, 77, and 74; the second 30 gave a total of 1415; a mean of 47.16; the 3 oldest 80, 75, and 72; the residue 20 observations gave a total of 997; a mean of 49.85 years; the 3 oldest 93, 80, and 75.

The aggregate of these 80 observations amount to 3678 years, giving a mean age of nearly 46. (After counting these 80, one was found aged 110, though I could not count it consistently with my plan, which rejected the principle of selection.) In the middle division of this cemetery, 30 inscriptions gave an average life of nearly 47 1-2 years.

By uniting these divisions of the Catholic cemetery No. 2 with that on Basin street, the observations will amount to 396—the aggregate 18,607 years, and the mean life of the whole, both of the whites and blacks, will be very nearly 47 years.

Of these 396 inscriptions, 49 were over 70;—15 were over 80;—5 over 90.

The black race in this cemetery, buried in a style of magnificence nearly equal to the white, has usually French inscriptions, indicating as the principal places of nativity, Louisiana, St. Domingo, Cuba, Jamaica, and Africa, and gave, in 150 observations, the results which the following table expresses with the utmost brevity: There may be some error in the third series—a discrepancy there seems to be, inasmuch as this series gives a comparatively diminished total and mean life.

SERIES THIRTY OBS. EACH.	AGGREGATE AGES OF EACH SERIES.	MEAN AGES OF EACH SERIES.	THREE OLDEST IN EACH SERIES.		
1st. Series.	1594	53.13	100	85	80
2nd. -	1364	45.46	64	80	75
3rd. -	1102	37.4	95	82	70
4th. -	1318	43.93	100	83	79
5th. -	1585	52.0	100	92	90
Total ages of 150.	6,969				
Mean age of 150 persons.	46.43 years.				

The united ages of the fifteen oldest persons in this enumeration amount to 1,398 years, affording an average life far beyond "threescore and ten," (the limit indicated by the royal poet of the Hebrews,) namely, 86 1-2 years, with two centenarians for every hundred; or as many of that age as France affords in about a half a million. Probably the entire number of vaults and tombs in the African cemetery does not exceed two thousand, nor the dead bodies exceed three thousand. Now, on the supposition that by some strange and incredible chance, the one hundred and fifty inscriptions I took note of, actually exhausted the whole number of centenarians, (which I know was not true,) still the colored centenarians, transcend French centenarians, two hundred and fifty times.

It will be seen that the black race affords, by these tables, 1 in 50, aged 100 years; and if we add 11 years to the lives of the remaining two oldest in the 150 enumerated, the result will be, five centenarians; or 1 in 30; or 8,333 times more than the ratio for all France; or 2,100 more than that of England, by the census of 1841; or if we take the official account of the deaths in France for the 15 years ending on the first of January, 1832, it will be found that 150 inscriptions give for the black race in New Orleans, nearly one fifth as many centenarians as 11,793,289, or nearly twelve millions, of deaths among the French. But, by an exact calculation, the French bills of mortality, as above mentioned, give one aged one hundred in every 471, 731; the black one in fifty.

Each of the remaining cemeteries of New Orleans, as they contain a greater proportion of strangers, will be found to offer a rapid decrement in the mean life. The new and extensive Protestant cemetery of the Second Municipality gave, in the first 30 observations, as the three oldest, 73, 42, 40; the second 30 gave, for the three oldest, 78, 69, 66. From 110 observations, a mean life was obtained of 30 3-4 years. The Hebrew cemetery gave, as the three oldest, 74, 63, 62, and an average of 27 years.

The Bayou cemetery, or Potter's Field, not having monumental inscriptions, with few exceptions, proved an unsuitable field for necrological researches. From the rude and frail memorials of the dead, I obtained thirty-five ages: the oldest three were, 55, 52, 46—the mean life of the whole, 27 3-4 years—a mean nearly twenty years less than that of the old Catholic, and the African cemeteries.

The city of Lafayette, separated from New Orleans by a street only, abounds with German immigrants, who, with the Irish, are in both cities the principal victims of yellow fever. The Lafayette cemetery is more favorable for inhumation in the ground than the New Orleans cemeteries; accordingly, this mode of sepulture is more common in the former. Among 30 ages taken from the vaults of that cemetery, 39 was the oldest, and the mean of the whole was only 20 3-4 years, which is the minimum of all the cemeteries, being 26 years less than that of the black race in the Catholic cemetery, and nearly two and a half times less than that on Basin street.

The Catholic cemeteries are supposed to reflect the creole life more accurately than the other cemeteries, which are newer, and have been filled with immigrants. The mean life, as deduced from monumental evidence, though not identical with that deduced from the recent mortality of the city, by the Board, is confirmed by the latter; that is to say, the Catholic cemeteries take precedence of the Protestant, and the Protestant of the Potter's Field. Any one acquainted with the different classes of the population would have anticipated these results.

A closer inspection of the city of the dead may not be inappropriate, but suggestive as

“To what base uses we may return, Horatio!”—HAMLET.

A vault is eight feet in its horizontal direction, 25 inches high, and 17 wide. Tombs are greatly varied in size. Of late years, wood has not formed a component part of vaults and tombs. The old Catholic and the old Protestant cemeteries have, in consequence of the wood in their structures, in many instances gone completely to decay.

Mahogany, and some other kinds of coffins, usually decay in two years, while cypress remains sound many years, varying, of course, according to the humidity, etc.

The body is completely decomposed, the bones separated, and the offensive gasses dissipated in about three months, in the hot season, and in six months in winter. I have found that the bones of the young and old would frequently crumble into dust, from a slight pressure, after an entombment of from 30 to 40 years. The sexton of one of the Catholic cemeteries, on opening a vault in the upper range, to remove a body long buried, found the corpse completely desiccated—no putrefaction had taken place; the hair and whiskers were firmly fixed, and natural in appearance; the face was but little changed, and the eyes, though greatly dried up, remained. In temperate climates, corpses buried in the ground require, probably, four years, at least, for decomposition, except the bones, which may last for indefinite periods.

The perishable structures constituting the necropolis of New Orleans, and the speedy delapidations which take place among them, often exposing the bones of the dead, cannot but inspire melancholy thoughts, such as Goëthe puts into the mouth of Faust: “Instead of animated nature, for which God made man, thou hast naught around thee but skeletons and dead men's bones, in smoke and mould. * * * Must I go on reading in a thousand books, that men have everywhere been miserable, that now and then there has been a happy one? Thou hollow skull, what mean'st thou by that grin? but that thy brain, like mine, was once bewildered—sought the bright day, and, with an ardent desire after truth, went miserably astray in the twilight?”

A few specimens of the literature of the tombs, mostly quotations, will be given:

“—There is not an hour
Of day, or dreaming night, but I am with thee;
There's not a breeze but whispers of thy name,
And not a flower that sleeps beneath the moon,
But in its hues and fragrance tells a tale of thee,
Poor Caroline!
Only 23!
Dearly loved, and deeply mourned, by one faithful heart.”

"Far from friends and home his dust mingles with strangers."

"Mother! sweet mother! thou can'st never know,
That yearly thus I deck thy mossy bed,
With the first roses of spring that blow,
And tears of fond affection shed."

"He was all in all to a disconsolate wife, a devoted daughter, and three little children."

"Alex. Milne,
The Orphan's Friend."

"Aged 21. Such has been her fate!"

"Victim de l'honneur!"

"For you, dear children, we will weep,
Until we join in your long sleep."

Lord Byron maintained that the following epitaph, at Bologna, is the best he had ever seen:

"M. L. *Implora pace.*"

He says, "I have never met with any epitaph, ancient or modern, that pleased me a tenth part as much. Can anything be more full of pathos? These few words say all that can be said or ought; the dead had had enough of life; all they wanted was rest; and this they *implore*. There is all the helplessness and humble hope, and death-like prayer, that can arise from the grave—*Implora pace.*"

From the tombs the transition is natural to

THE MORAL ASPECT OF NEW ORLEANS.

The social physics and dynamics of a community are but combinations of the family elements. If the latter be not to a great degree fixed—if local attachments be not formed—if a home for life be not selected, society must be too transitional—the hallowing influence of family must be diminished, the principle of repulsion become stronger than that of attraction, the dynamic overbalancing the static. In a community of strangers, all bent on gain, which they intend to carry off after a temporary residence, society cannot be altogether perfect. A great proportion of the inhabitants have little or no family attachments for the city, except such as grow out of money-making. The poorest Arab thinks himself most happy to be admitted into Mecca, which he calls the city of God. An Italian poet prayed the eternal gods to destroy him on the day that he forgot Rome. The Neapolitan exclaims, "See the bay of Naples and die!" Nostalgia, or home-sickness, has often caused a desertion in armies, suicide, insanity, and death.

"The intrepid Swiss who treads a foreign shore,
Condemned to climb his mountain cliffs no more,
If chance he hear the song so sweetly wild,
Which on those cliffs his infant hours beguiled,
Melts at the long lost scenes that round him rise,
And sinks a martyr to repentant sighs."

But in New Orleans a love of absenteeism for half the year rages. People get sick of home, and sick for other lands.

In a community whose chief good, and whose irrepressible desires all centre in money, and whose home is determined by these ends only, public morality and the religious sentiment must be at a low ebb. These evils, though not inherent to, are more apt to predominate in, a commercial community than in one where fixed capital, machinery and work-shops tend to fix families for life. The reflected influences of family will best secure the faithful administration of the laws, the protection of life, liberty, character and property, and, indeed, whatever is necessary for the well being of society. Who can doubt that the inordinate love of money, and the absence of the paramount and antagonistic influences of family in California, are the causes of the present disorganized state of society throughout that land of gold, murder, and robbery? Without admitting the charge by a foreign author, that life is less secure in New Orleans than in any city in Europe, it must be confessed that personal violences and murders are too frequent in this city.

Probably no city of equal size in christendom receives into its bosom every year a greater proportion of vicious people than New Orleans. The crimes against persons and property are committed

chiefly by this floating population. Among the resident population the sentiment of religion is prevalent, being at the same time devoid of intolerance. Christians and Hebrews, Protestants and Catholics, are tolerant without indifference, denominational without bigotry, and charitable without ostentation.

SANITARY HISTORY OF NEW ORLEANS.

There is not, probably, any considerable city in North or in South America, including the West Indies, whose sanitary history is so favorable as that of New Orleans, until near the close of the last century. Not long after the foundation of the city, the Parisian press teemed with works on Louisiana, its climate, topography, botany, zoology, and its native Indians. Some of these works were of an official character, having originated in scientific expeditions ordered by the French Government. Charlevoix's work (3 vols. 4 to.) describes the city 4 years after its foundation in 1718,—animadverts upon its topography, estimates its population in January, 1722, at 200, who lived in huts upon the river's bank, the regular houses not having been as yet constructed. Laval's work on Louisiana was published in 1728. In neither of these works is the salubrity of the climate questioned. Du Pratz, in his history, (3 vols. 1758,) maintains that life in Louisiana was not only pleasant but long. La Harpe, the agent of the French Government, sent to explore the boundaries, climate, &c., of Louisiana, arrived at New Orleans in the Fall of 1718. In 1724, after having spent five years in Louisiana, chiefly in New Orleans, he returned to France. His journal is minute, but contains no account of fevers, or other epidemics in the colony. He estimates the inhabitants of the city, including the troops, at sixteen hundred—the climate as being temperate—the air as salubrious; (355, 356.) The people, he continues, were entirely exempt from the epidemics which desolated other parts of North America. New comers, for the most part, were attacked with a slight fever (*une fièvre lente*) which caused debility, but never death; (on ne voit pas de personnes en mourir.) The province, which had a black population of 1,600, was everywhere salubrious, particularly along the sea shore.

Lozieres, in his second voyage to Louisiana, 1794 to 1798, (2 vols., Paris, 1803,) asserts the salubrity of New Orleans, and seems much puzzled to explain it. He concludes, however, that the cause must be sought in the universal use of the Mississippi water; (T. i., 313.)

In a work published in Paris in 1802, edited by Duvallon, founded on a three year's actual residence, Louisiana is described as exempt from epidemic diseases, its fevers were mild, and rarely dangerous; the rate of mortality was small; whites and blacks of both sexes lived long, and were still fresh and vigorous at the age of sixty. The writer gives a flattering account of the physical conformation, fine complexion, and rare beauty of the *dames creoles*. The sanitary condition of the city he maintains as being good, with the exception of the yellow fever. He says that this malady was not proper to the place, and had not been known until within the six or seven years preceding 1802, a period during which it had prevailed nearly every summer, and was attributable to the commercial intercourse with the North Americans, and to the increased heat of the climate incidental to the clearing away the forest, and the exposure of the soil to the sun's rays.

This author asserts that from the end of October to the beginning of July, there is in both town and country but little sickness, and that death but rarely occurs. During the hot season of three years preceding 1803, the mercury arose no higher than from 24 deg. to 26 deg.; (Reau,) nor did it descend in the winters lower than two degrees below the freezing point.

Robin, in his travels in Louisiana from 1802 to 1806, (3 vols., Paris, 1817,) avers that the country has but few chronic diseases, diarrhoea being the most common and fatal. He mentions sore throat as sometimes prevailing among children; also, infantile tetanus, (*le mal de machoire*), together with yellow fever, which a few years previously had appeared for the first time in the city, and which he identifies by Father Labat's description, enlarging on its pathology as a disease of the blood, or rather as a rarefaction of that fluid, causing dilatation, tension and compression in persons from the North, whose blood he supposes is too rich and dense. Tropical acclimation, according to him, renders the blood thinner, lighter, and less dilatible.

The celebrated statesman, Count de Vergennes, in a memoir on Louisiana, addressed to his Government during the early days of the American Revolution, says: "I repeat what I have so

often said, that Louisiana is, without question, the first country in the world as to mildness of climate, and its happy situation."

The immigrant to New Orleans runs the risk of the yellow fever during the first few, say 3 to 4 years, a great proportion escaping altogether, and a few suffering an attack after a more prolonged residence,—one attack with continuous residence protecting against subsequent attacks. His dangers from epidemic fevers are, therefore, compressed within a few years, while in Northern latitudes, or even beyond the limits of the city, he is, during life, exposed to the risks of epidemic, bilious, remittent, intermittent, congestive, typhus, and typhoid fevers.

The yellow fever is emphatically the strangers' fever; individuals long resident, and natives of the city, being as little liable to take this disease as the vaccinated are to contract small pox.

Independent of emigrants, New Orleans receives within its limits for a few days or months a greater proportion of floating population than any other city, arising from its commercial character, geographical position, easy access by rivers, lakes, and seas, and from its public charity, thus becoming the asylum of foreign paupers passing through or temporarily resident in it. To these may be added sick and destitute boatmen, seamen, ditchers, wood-choppers and raftmen from the valley and swamps of the lower Mississippi, not to name a vast many poor consumptives seeking the benefit of the climate. Besides, New Orleans has been, and continues to be, the recipient of the broken down soldiers, the *debris* of the armies of Generals Taylor and Scott. The unparalleled California emigration contributes in the same way.

Dr. W. P. Hort, of the U. S. Mint, has examined this subject with a ratiocinative and inductive ability characterizing all his contributions to science. Dr. Hort says:

"We will now concentrate the following details: The floating population of New Orleans is furnished by the following States—California, Texas, Alabama, Florida, Louisiana, exclusive of the city of New Orleans, Arkansas, Missouri, Illinois, Indiana, Ohio, Wisconsin, Iowa, Tennessee, Kentucky and Mississippi. Do all the citizens from these States enjoy an immunity against disease and death? Then we have the Irish and German immigrants, besides a large number of Irish laborers, who gain their living on the coast by digging canals and ditches. Working in mud and water, with the hot sun beaming its fierce rays upon them, they are afflicted with much sickness, and when sick they come to this city to die, with few exceptions, in the Charity Hospital. What have they to do with our calculations of disease and death amongst the resident population in this city? They do not contract disease here, *but they come here to die*; and this again is charged to the resident population.

"Having now alluded to all the floating population from every source, and who are much more liable to disease than the resident population, we shall proceed to make out our per centage of deaths, including all, resident or not resident, acclimated or not acclimated. We begin, then, with—

130,000 resident native, acclimated or unacclimated, population of New Orleans and Lafayette.

125,000 strangers from the Western States.

25,000 Californians,* going to and returning from California.

125,000 immigrants, and strangers from Texas, Florida, Alabama, West Indies, etc.

405,000 grand total, *subject* to disease and death. Then

$405,000 \div 8086 \div 100 = 2.65$ per cent., which will compare favorably with any of the other cities of the United States. We do not pretend to say that this calculation is mathematically correct, but we believe it to be sufficiently approximative for all practical purposes." (*N. O. Med. and Surg. Journal*, Nov., 1851.)

In the New Orleans Medical and Surgical Journal for September, 1851, at page 237, the reader will find an article from the fertile pen of Dr. Cartwright, bearing the impress of his massive intellect, in which he has applied the principles of statistical evidence to the recent investigations that have been made into the sanitary conditions of this city. Dr. Cartwright truly says, "the question in regard to the salubrity or insalubrity of this city, the door to the Mississippi valley and to the Pacific settlement, concerns not only the people in it, but the world at large, particularly the people of the upper and middle portions of the Mississippi valley, who are tapping it by railroad and canals, and many of whom are under fears of perishing almost necessarily with disease if they come to this market."

If New Orleans was proved to be the most healthy city in the world, yet from the excessive dynamism of its population, its apparent mortality would be considerable, as ascertained by ordinary statistical methods, that apply very well to communities where the movement of the population does not diverge from the ordinary course. Thus, the total number of deaths distri-

* Dr. Cartwright's estimate is more than double.

buted or divided into the total population, as found by the census, will show what the ratio of mortality is in one or any number of years. This rule, applied to the highly dynamical condition of New Orleans, destitute as it is of records, will mislead in making numerical comparisons with other cities, having a fixed population, and different conditions.

An extreme case will best illustrate this principle: Suppose that the population of New Orleans is 100,000; suppose the pursuits of wealth, the exigencies of commerce, war, and other causes, shall attract 400,000 persons to this city during an epidemic; one-fourth of whom shall die of disease wholly foreign to the resident population, as yellow fever. The survivors all retire, leaving, of course, their dead, which, instead of being charged to the statistical account of these strangers themselves, will be reckoned, according to our present system, in the bills of mortality of the city proper; consequently, it will appear that there is not, at the year's end, a single person left alive in the city. This, it may be said, is a clear proof of the inherent mortality of the city. To illustrate this point, assume, on the contrary, another extreme case, namely, that New Orleans is of all cities the most salubrious for both natives and strangers; yet it may be confidently affirmed that its ratio of mortality will be comparatively high, if deduced by this numerical method.

Again, suppose that her Britannic Majesty's subjects of the city of London were to visit New Orleans every year for pleasure, or health, and there can be but little doubt that during winter they would be gainers, as to the latter, by escaping typhus, pulmonary diseases, etc.; still this migration would, from the first of November to the first of May, throw into the necropolis of New Orleans perhaps twenty-five thousand dead bodies, which, according to figures, as now used, would prove that one in every four died annually in this city, even though not one citizen should die during the whole year. Nay, on the supposition that creoles and acclimatized of the city are immortal, and that others only die, still the mortality must be considerable.

It will be seen, according to Dr. Hort's estimate, that the non-residents temporarily in New Orleans exceed the residents more than two to one; these leaving their dead behind them, to be enumerated as properly pertaining to the population proper of the city. Now, according to an eminent statistician, M. D'Angeville, the annual increase of population in France, for 36 years, ending in 1836, was only 147, 918; that is, but little more than half as much as the annual increase for a part of the year in New Orleans, as estimated by Dr. Hort. M. D'Angeville shows that France requires 139 years to double its population, while Dr. Hort shows that New Orleans more than doubles its population in part of a year, though at the close of the business season the city may have received no permanent accessions except corpses. No city, how healthy soever it may be, can have, under such a system, any other than a high ratio of mortality.

It is a problem unsolved by experience, whether a migration of the natives of these hot countries to the icy circle, would not be more fatal than that of the Northerners towards the torrid zone. Would not northern typhus, with pulmonary diseases, transcend in mortality southern remittent and yellow fever?

But in no case can acclimating diseases be received as the precise standard of salubrity or insalubrity for the entire, much less native population.

The sanitary statistics of New Orleans have been derived, in too many instances, from the books of the Charity Hospital, which is virtually a great foreign institution, located in, but not for New Orleans. Thus, in twenty years, ending in 1850, the admissions of patients into that institution (according to Dr. Fenner's valuable Medical Reports) amounted to 123,917, of which number only 1,293 were Louisianians, that is to say, about one in every hundred. But probably not more than half of these were citizens of New Orleans; that is, one in every two hundred. Admitting, what is generally conceded, that the hospital admissions represent from 1-4th to 1-3d of the whole number of sick strangers; but taking the latter ratio as a guide, it follows that 371,751 strangers are to be charged to the sick list of the actual citizens of the town.

The report of the Board of Health of New Orleans, for 1849, (one the least flattering to its sanitary character ever made,) shows that in the Catholic cemetery, for four years, ending in 1844, among 442 deaths there were ten aged more than one hundred years! Now, it requires nearly two and a half millions of people in France to produce ten centenarians,* according to the

* Essai sur la Statistique de la Population Francaise. Par le Comte A. D'Angeville.

census, and still more according to the official bills of mortality. The entire department of the Seine (Paris) would have only eight centenarians, provided it had *ten millions of inhabitants*,* which is nearly one-third of the population of the entire Republic. New Orleans, according to this ratio, gives, in its necrological record, one in forty-four aged beyond one hundred years; while, by the census of 1840, there is in the United States but one in 6,157 aged one hundred years. In England and Wales there is but one of this age in every 55,555; in France, one in every 250,000. The centenarians in the Catholic cemetery are, therefore, nearly six thousand times greater (in equal numbers) than in France. Even the Potter's Field, according to the Report, in 8,566 gives nine centenarians, or one in every 951, that is, about 26.3 times more than the French Republic.

The Report asserts that "the average age at death in the Northern cities, (doubtless owing in a great measure to the large mortality in infantile life,) is from nineteen years, nine months, to twenty years, three months, and in some of the cemeteries, where destitute foreigners from the crowded parts of the city of Boston are buried, it is reduced to 13.49. * * * * In the city of New Orleans, the average age at death for the last year was 26.69, and for a series of years, the aggregate of all the cemeteries was 22.63." Is an increased average life to be considered a proof of the insalubrity of our climate, especially when that life is twice as great as in some of the cemeteries of Boston? The foreign population of Boston is about equal to the native. Nearly all of the former are Irish. These Irish, in going from their own country to Boston, go to a climate like their own, not to a tropical climate, as in New Orleans—an important consideration.

Now, the Report shows in the Potter's Field, or Bayou Cemetery, (the great Irish necropolis of New Orleans,) that the average life taken for six years, ending in 1846, is nearly twenty-four; that is, nearly one-fifth more than the native and foreign mean life of the most favored Northern cities.

The Report estimates the mortality for 1849 at 9,862, of which number Louisiana and New Orleans furnished less than one in every twelve, and the residue of the United States about one in twenty. Those known to have been foreigners, (3,569,) and those whose places of nativity were not known, that is, 4,985, were probably nearly all foreigners, negroes excepted. The United States, including Louisiana and New Orleans, contributed to the whole number, namely, 9,862, only 1,308. Now, let us give the Report nearly twice as many deaths for the United States, namely, 1,017 more than the number mentioned in the Report, whereby it will appear that foreigners, nevertheless, exceeded Americans between four and five times, or, by the figures of the Report, nearly eight times. Can any other city show a mortality in which *its own share*, including that of the temporary residents of the whole State, is less than one in twelve? Concede to the Report 1,017 deaths of native Americans beyond its own account—admit (what is probably true) that all the centenarians mentioned are natives, and what is the result? The Report gives one aged 130, one aged 110, one aged 105, and twenty aged 100, or twenty-three aged 100 and over; that is, more than one centenarian to every 101, or 2,500 times more than France; or, taking the deaths of Louisiana alone, twenty-three centenarians in twenty-nine deaths, or one centenarian to thirty-three deaths among the natives of the city.

Even the cholera passed by the natives of New Orleans to a very great degree, taking the Report as authority. Thus, of 3,171 deaths which took place from that disease in 1849, the natives of the city and State contributed only 106; or 1 in 30 nearly of the whole. Among 783 deaths from yellow fever, the State and city contributed 2, or 1 in 391.5, and among 640 deaths from all other fevers, but 17, or about 1 in 40.

The mortality of 1849, though great, illustrates the mortuary statistics of N. O. for other years. Dr. Fenner, in his Medical Reports, shows that in 1849 the total number admitted into the Charity Hospital of New Orleans was 15,558—of these 13,634 were from foreign countries; from countries unknown, 142, probably nearly all foreigners, making 13,776 foreigners; from the different States of the Union 1,782 were admitted, leaving, as he shows, only 147 for all Louisiana; that is, one Louisianian for every 10,397 patients born in other climates.

Dr. Fenner shows that of the whole number admitted into the Charity Hospital in 1849, 17

* *Essai sur la Statistique de la Population Francaise. Par le Comte A. D'Angeville.*

1-2 per cent. died, making 2,739 deaths. This ratio will give Louisiana about 27 deaths—but several reasons could be adduced rendering it probable that Louisiana did not furnish an average mortality half as great in the 100 as foreigners—say 12 in 147. Here, then, are 12 deaths in 2,727, or if figures be taken without explanation, 147 sick Louisianians furnished, in 1849, no fewer than 2,739 deaths.

Dr. Fenner gives the statistics of the Charity Hospital for 20 years, ending in 1850; admissions, 123,917; of these 1,283 were Louisianians, a little over one in a hundred. Adopting the usual estimate, namely, that the other hospitals and the private cases in the city exceed those of the Charity Hospital in the ratio of two to one, then the last twenty years gave 321,917 cases of sickness, of which 3,879 were from Louisiana—in round numbers, 3,000 to 318,000.

Of 1,800 who died of yellow fever in New Orleans in 1841, the State of Louisiana and its cities contributed but eight, or 1 in 225; the nine most southern States, including Texas, only twenty-five, or one in seventy-two; and the entire black race only three, or one in six hundred.

The hospitals of Paris are for Frenchmen; the Charity Hospital of New Orleans, the only one in the State of Louisiana, is virtually for foreigners. In Paris one-sixth of the whole population die in the public hospitals.* In a population of 700,000, no less than 70,000, or one in every ten, pass annually through the public hospitals,† while in the Charity Hospital of New Orleans, the whole State, in twelve years, ending in 1842, supplied, among 59,021 patients, only 556, or 45 annually—that is, one to 7,831—a ratio 783 times less than that of Paris. In 1842, among 4,404 patients in the Charity Hospital, Louisiana furnished only 34, not one in ten-thousand of the inhabitants, or one thousand times less than Paris. In Dublin, in 1827, more than one in four entered the fever hospitals of that city, namely, 60,000‡—a ratio twenty-five thousand times above that of Louisiana.

The vital statistics of Southern climates have been, in most instances, based on army reports relating to shifting masses of Northern, dissipated, unacclimated troops, among whom the ratio of mortality is high. But is this the true test of the insalubrity of a climate, except for that particular class? As well might the ratio of mortality in a country be deduced from the mortality of its battle fields. The Mars of modern times, whose star culminated over central Europe, paled and fell under the inclemency of Russian skies. The sun never shone upon a more powerful army than that which Napoleon marched into Russia in 1812. Of half a million of warriors, (who were successful in nearly every encounter) only 80,000 escaped. The residue perished in a few weeks, chiefly from the coldness of a Russian winter. But this great mortality does not indicate the true ratio proper to the climate.

The scope of this paper does not include the special investigation of the climate of New Orleans as it affects immigrants alone. Acclimation is a subject so difficult, so extensive, and so important, that it cannot be disposed of in a summary manner. Accurate popularized information on this subject is a desideratum. A great and sudden transition from the North to the South, or from the South to the North, is not devoid of danger. Even the Esquimaux dogs just brought to New York by the American Polar Expedition in search of Franklin, died soon after reaching that city. The learned Dr. Copeland (author of the Dictionary of Medicine, a work of which even England may be proud) says that “a native of Africa who removes directly to Europe, seldom lives over two winters.” Of the vast number of destitute families who come from high Northern latitudes to this city, few, comparatively, intend to settle permanently, and few remain beyond the acclimating period. Hence arises a useless waste of life. The acclimated are constantly replaced by the unacclimated. Wave follows wave—epidemic, epidemic. The prudent, and those who possess means to command the physical comforts, including the timely aid of doctors and nurses, incur but little danger during an epidemic, and obtain great advantages in their subsequent immunity from epidemic fevers.

TABLEAU OF THE SANITARY LEGISLATION OF NEW ORLEANS, FROM 1821 TO 1846.

Of the existing sanitary laws conferring a limited power upon the present Board of Health—of the disinterested and patriotic labors of that Board—of its judicious advisory and practical

* Dupin, Alison.

†ib.

‡Alison.

action, and of its exemption from unscientific ultraisms, I will say nothing. It is not every city that has a *harmless* Board of Health, as impartial history proves, and as the slight retrospection that follows will show.

By an act of the Legislature of Louisiana, passed in February, 1821, "providing against the introduction of infectious diseases," a Board of Health, composed of the Mayor, five aldermen chosen by the Council, and seven "*inhabitants*" chosen by the Governor and the Senate, was constituted and clothed with plenary powers—powers (unlike those of the present Board) combining the legislative, judicial, and executive functions to an extent scarcely warranted by the constitution of any free Government. The Board had to establish a police to cleanse the streets, fill up lots, to employ men, boats, and the like; to limit, under heavy penalties, the number of lodgers in taverns and boarding-houses according to the "number of cubic toises of air" in each room, (all of which was left to its own determination); to license boarding-houses, taverns, and shops at the quarantine ground; to impose sundry fines, and to perform many acts incurring pecuniary responsibilities without limit; to appoint seven health-wardens with the powers of constables, and to require of the same obedience; to buy land and build on the same, and to publish a daily detailed account of deaths from May to October, and a weekly account for the residue of the year. The Governor and Senate appointed a health officer, and a resident physician. The latter, with the health officer, before entering on the duties of his office, took an oath to the following effect: "That whatever may be his opinion of the origin or infectious nature of the yellow fever, he will be as vigilant in preventing its introduction as if he knew it to be infectious and of foreign origin, and as careful in detecting and removing the causes which are supposed to produce it in this city, as if he believed it might originate here, and that he will well and truly perform the other duties of his office." He was required to visit every week all vessels in port, from the first of June to the first of every December, and to visit every vessel ascending the river above Fort St. Philip; to act as a justice of the peace; to examine, under oath, into the sanitary condition of all vessels; to give passports, or to detain vessels; to reside constantly at the quarantine ground; to visit the sick; to report to the Board of Health, &c. Quarantine continued as long as the health officer pleased, not less, however, than fifteen days after the purification of the vessel, and the recovery of the sick. Vessels were to be cleansed and whitewashed, "not painted or varnished." All vessels arriving from places where "yellow fever or other infectious diseases had prevailed at the time of sailing, were subject to quarantine of not less than ten days. All vessels whatever coming from the West Indies or the continent, between 15 deg. S. lat. and 24 N. lat., however healthful the places from which they sailed may have been, were, nevertheless, subject to a quarantine of five days. All vessels bringing putrid matter, vegetable or animal, as hides, and the like, were, after the destruction of the same, still liable to ten days quarantine;

Vessels from any port in Europe, arriving between the 1st of May and the 1st of November, bringing more than twenty passengers, commonly called redemptioners, were not, however healthy, permitted to come within three leagues of the city until after the 1st of November, in any year. The captain or consignee of the vessel was bound to that effect in the sum of three thousand dollars, as well as to pay the cost of the arrest and the transportation to the quarantine ground of any redemptioner found in the city. Any person escaping from quarantine incurred a fine of five hundred dollars—a vessel, one thousand. A fine was imposed of three hundred dollars for landing any passenger in the State without having first submitted to quarantine. Hence it is evident that all vessels were under the necessity of touching at New Orleans, though destined to a distant bay, river, or lake.

Although the Board of Health received no compensation, yet several officers connected with it received salaries. The Board was organized in March, 1821. It located the quarantine ground at the English Turn, and expended more than twenty-two thousand dollars in its operations. The year 1821 proved very healthful. The Governor, in his message of January, 1822, declared that "New Orleans had been for twelve months the healthiest large town in the United States"—a result which he attributed to the quarantine laws. The fact relating to health could not be denied. The explanation was good;—the logic was convincing. Contagionists triumphed for eight months. The river moved silently along, but wailing was heard in every street. The stars shone brightly, but a thousand eyes were dim with tears and red with weeping. Hearse

followed hearse, coffin rumbled after coffin. In a few days the Board had on its black list of yellow fever victims 802 names! In August, 165 died; in September, 582; in October, 665; for the most part, from yellow fever.

The Governor had to write another message; but how different! "The city," says Governor Robertson, "has been again visited with the yellow fever. It was an idle waste of time, for me, at least, to inquire into the causes, origin and nature of this dreadful malady; most of the various opinions with respect to it seem to be sometimes but too true. We find it in the humid and heated atmosphere of New Orleans—in Pensacola, surrounded by arid plains, and fanned by breezes from the sea—in the comparatively cold regions of the Northern States. For anything that is to be established to the contrary, it is foreign and imported, or indigenous, and contagious or not, according to circumstance or accident.

"The State resorted to quarantine, under the expectation that it would add to the chances of escape from this dreadful visitation. If this hope be fallacious, if no good effect has been produced, if even a procrastination of its appearance has not resulted from the measure, then should it be abandoned, and our commerce relieved from the expense and inconvenience which it occasions."

The Committee of the House of Representatives on quarantine laws, reported that "during the last year, [1822,] notwithstanding the *strictest compliance with those laws*, our expectations were frustrated at the very moment when we thought we could indulge the hope of the most complete success. The season was far advanced, and in the month of September this metropolis enjoyed the most perfect health, when the yellow fever made its appearance."

Observe that this report was made by a committee altogether in favor of quarantine. They honestly acknowledged its failure, but recommended its continuance in the most rigid form, because it had not been tried sufficiently long, and because other States had similar regulations! The committee avow their belief in the contagious nature of yellow fever, and even adopt the opinion of the Board of Health, expressive of its importation from Pensacola, through Bayou St. John.

The Report of the Board of Health to the Legislature is very brief, and quite unsatisfactory, not to say absurd. They attack the physicians without ceremony for their disbelief in contagion, and seem to think that in opposing their own opinion to that of the faculty, they have offered proof good enough for anybody:—"The opinion that yellow fever is *not contagious*, is *directly opposed to that of the Board!*" This pride of opinion sought to sustain itself with facts, as will be seen hereafter, and with such facts!

The Report says that "up to the end of August the inhabitants had not suffered from any malady. About the end of that month the yellow fever was *imported*, by a vessel from Pensacola, in a family named Lynch. This family, of which every member but one fell victims to yellow fever, were lodged in Bienville street when this disease first manifested itself, and spread to the different parts of this city, striking in its course all unacclimated persons, who were the sole victims of this scourge."

Poor, slandered Pensacola! That sapient maxim of the law, the greater the truth the greater the libel, does not apply in this case, as may be seen in that excellent little work, "The Medical Statistics of the United States' Army," published in 1840. The report of Assistant Surgeon McMahon shows that, on the 1st of July, a cargo of fish had reached Pensacola, "*in an unsound state.*" Nothing serious, however, happened for a month after, until an "*unsound*" young lady arrived from New Orleans—that is, a young lady with black vomit. She was just from New Orleans. The contagion must have been imported "in" her, for the same reason that is given for its "importation in the Lynch family." She died. Soon after, the epidemic broke out in Pensacola, and about one-fifth of the inhabitants died in a few days.

New Orleans infects Pensacola, and Pensacola infects New Orleans! The one sends a young lady, the other sends the *Lynches!* Havana has blamed Charleston, for nearly a century, in the same amusing manner; and Charleston has retorted perhaps as often. The Board strongly advocated the continuance of quarantine; as did the House of Representatives, by an immense majority, by adopting the report of its committee. In the meanwhile, the great public, the men of business, felt no sympathy for an ideal or theoretical dogma which their own observation con-

tradicted, and which placed them in the situation of those victimized frogs which, being stoned by certain boys, protested against the same, alleging that the pelting of frogs was very amusing to the boys, but death to the frogs, and, consequently, to their business.

On the 23d of January, 1823, a large public meeting took place, in which it was moved and carried "that the late epidemic had tested the total inefficiency of the quarantine laws and regulations; we consider them not only useless, but in the highest degree oppressive and injurious to the commerce of this city; and that application ought to be made to the Legislature for the purpose of having them annulled." A memorial was addressed to the Legislature, accordingly, for that purpose.

The year 1823 completed its orbit without an epidemic. The contagionists, in the Legislature and in the city, reigned. In January, 1824, the Governor congratulated the Legislature on "the exemption of the city from contagious diseases." But in November of the same year he says, "New Orleans has been again subjected to the dreadful scourge." He seems to incline to the doctrine of its domestic origin, and suggests the propriety of bringing the business season to a close by midsummer, and recommends a general flight to the unacclimated; adding, concerning yellow fever: "Amidst the gloom which its fate inspires, may we not be permitted to indulge the cheering hope that the city is not doomed to suffer always?" Some writer defines *resignation* by the word *despair*;—destiny and despair are poor comforters.

The contagionists now began to waver. The committees in both Houses of the Legislature disagreed on quarantine, and were discharged from the consideration of the same on the 30th of November. To disunion, a revolution in opinion succeeded. In less than three months afterwards, an act was passed (February 19, 1825) repealing the quarantine laws of 1821, directing the sale of the grounds belonging to the establishment, and empowering the Governor and the city authorities to establish a sort of *quasi quarantine*, at their discretion, but refused them the power to *stop any vessel unless the resident physician shall determine that the vessel is unfit to enter into port*.

Æsculapius was omnipotent. He held the balance of power. He could, in effect, veto or nullify the acts declaratory of an actual quarantine. His mere theoretical opinion bound commerce in chains, upon rivers, gulfs, and seas. It furled the sail. It put out the steam. Now, when a theory is intrinsically visionary or doubtful, indigestion, bad sleep, the last medical romance on contagion, an old prejudice, or a new whim, may turn the scale in the mind of the "Resident Physician." The terrible decree goes forth, and perish commerce rather than sacrifice an opinion made up and expressed to all the world!

As quarantinists seem to be astrologically, or at least mystically inclined—as their love of the number FORTY testifies—it might not be improper to inform them, that as soon as all quarantine was removed from New Orleans the yellow fever began to diminish. For eight years, the mortality never, in any season, equalled that which occurred under the strict quarantine of 1822. During this latter year, nearly half as many died as in the long period intervening between the abolition of the quarantine and the invasion of the epidemic cholera—a period of eight years. Had this decrease taken place under a quarantine *regime*, a thousand glittering swords of logic would have leaped forth in its defence: *Salus populi suprema est lex*.

From 1837 to 1843, five epidemics swept, tornado-like, through the streets of New Orleans. A triennial, or rather a triune epidemic, commenced in 1841—an account of which would fill a volume, and which is here alluded to solely for the purpose of denying that the epidemic was introduced by the ship *Talma*, and for the purpose of remarking that the statements concerning the same gave a new impetus to contagion.

Early in the year 1844, the late Professor Carpenter (one of the brightest ornaments of the University, and the State of Louisiana) published an Essay "to disprove the domestic origin, and to demonstrate the transmissibility of yellow fever." Dr. Carpenter's contributions to the periodicals of the day were indicative of a logical mind and profound research, with the single exception of this paper, the historical data of which are essentially defective. But the influence of this essay was great upon the legislature. With the suddenness almost of a thunderclap, on the 1st of March, 1844, the committee of the House of Representatives brought in a report in favor of establishing quarantine, for the following reasons:

“I. That yellow fever is invariably known to appear first in the shipping.” This is a stereotyped error, as I could prove.

“II. That it never exists in Baton Rouge, Bayou Sara, Natchez, Vicksburg, or any other towns up the river, prior to its breaking out in New Orleans.” A half century proves the contrary. It is sufficient to mention Woodville, an inland town in the State of Mississippi, which was desolated for the first time, by yellow fever, in 1844. Four-fifths were attacked, and one-sixth of the whole population died, while all other towns, including New Orleans, escaped. But admitting the fact to be true, it proves nothing for or against contagion. If yellow fever be developed during the hot season, it is reasonable to suppose that it would generally begin in Havana or Vera Cruz, before New Orleans; in New Orleans before Natchez. Frost is not produced by contagion, yet it takes place in a regular progression, in the contrary direction, from North to South. This piece of legislative logic amounts to this: yellow fever happens sooner in some certain latitudes or places, than in other latitudes or places. Here is one of the very few instances in which the meteorology of the seasons throws a light upon etiology. Yellow fever is not deducible from any exactly determined altitude of the quicksilver, but it is connected (no matter how) with the hot season, with urban localities, unseasoned constitutions, and so forth; and where the seasons, etc., are most advanced, there might yellow fever be expected first, etc.

“III.” and “IV.” “That it,” yellow fever, “has never yet prevailed in the calaboose,” the prison, “nor in the convent in this city. That while the disease prevailed last fall,” 1843, “to a considerable extent in Baton Rouge, not one single case occurred in the Penitentiary.”

The fact advanced by the committee concerning the calaboose or old city prison, cannot be questioned; inquiry and observation, during fifteen years, and the examination of many state papers, convincing me that here is, perhaps, the most important fact ever yet made known in relation to the origin, or rather prevention of yellow fever. It is worth more than a thousand volumes of speculation. Many years ago, the Governors of the State, in their annual messages, frequently alluded to this fact as an indubitable proof of the efficiency of quarantine laws! The legislative committee only reiterated an argument almost as old as the yellow fever of the city. No one, it is supposed, has ever attempted to answer this fallacious application of a fact which, when duly appreciated, instead of favoring contagion, disproves it altogether. The old calaboose was in the heart of the city, adjoining the cathedral, and completely surrounded by the densest population, from which its inmates were separated by nothing but walls and iron bars. This was all the *insulation*, the only *cordon sanitaire*. No fumigation; no quarantine were performed fifty miles from town; communication was free; new prisoners, visitors, officers, clothes, goods, and all the materials required for one or two hundred persons, were daily sent in from the “infected districts,” and ought to have been saturated by contagion. The prisoner looked out of his grated windows by day and by night, into the chambers of the dead and dying in his vicinity. It so happens, that in yellow fever seasons crimes abound, and the prison is usually crowded. The humidity, the lack of cleanliness, added to this crowding, can be proved by official documents, and gave rise to complaints by governors and visiting committees, who, nevertheless, assert that the prisoners were in good health! When the calaboose was removed to the rear of the city, in the swamp-district, on the Old Basin, the same exemption followed. In 1837, during an epidemic of the most fatal character ever known in this city, one hundred and eighty persons were confined in this prison. They were mostly young or middle-aged men, incarcerated for small offences, or vagabondism. In my daily visits, for some weeks, I noticed that they were as badly clothed as Jack Falstaff’s regiment: a number of them had no shirts, but pantaloons only: they were nearly all strangers, and just the subjects for the fatal form of yellow fever. Probably one hundred and fifty of these men would have taken the yellow fever, and perhaps fifty would have died, had they been restored to liberty at the beginning of the epidemic. Yet not one died of yellow fever in all this crowd! Not one was attacked! I do not wish to stop here to offer any explanations, even were I competent. Women who are little exposed to the sun, or to severe exercise, or intemperance, and the like, often escape, and rarely die from yellow fever.

There is, if we may reason from what is known, but one certain method of escaping yellow

fever in New Orleans—*incarceration*! That may always fail hereafter, but so far, it has not. It may be that a church, a theatre, or private dwelling, would answer for the same purpose equally well. Here, as is usual, the rich have the advantage. The poor cannot afford the luxury of complete imprisonment.

The third and fourth conclusions of the legislative committee have, therefore, no connection with this matter, unless it be to show the *incommunicability of yellow fever to persons incarcerated*; though volume after volume has been sent forth, to show that crowding, filth, humidity and the like, incidental to prisons, either originate or propagate contagion in all cases. Hence, the accounts of the Black Hole of Calcutta, the Old Bailey prison, and jail fevers, all go to show that the same ought to happen in New Orleans.* Such is not the fact, and the whole benefit of the argument is with the anti-contagionists. The daily introduction of new prisoners, of visitors, and of the materials necessary for the use of hundreds of persons, to say nothing of the exposure to the concentrated aerial or volatile streams of contagion incidental to the densest part of the city, ought surely, according to the views of contagionists, to communicate this disease to the prisoners, especially when no precautions are even thought of, as is the case in New Orleans. Whether insolation of the soil, or of the person, or something else, be regarded as the cause of yellow fever, is foreign to our present inquiry. In a word, the very curious fact, that a certain spot in New Orleans is free from yellow fever, where, according to *à priori* reasoning, it ought to appear, affords no proof whatever in favor of the conclusion drawn from the same by the committee. The House of Representatives of Louisiana refused to pass the quarantine which its committee reported: so it sleeps, like “the mighty Hector’s shade.”

Such is the legislative history of quarantine from 1821 to 1846, divested of all extraneous matters. I have avoided its early history, as well as that of the epidemics with which it is connected, because the subject is too extensive for this paper. And what does quarantine promise? Under the illusive attempt to exclude yellow fever, see, seventy miles below New Orleans, a forest of masts, under the guns of Forts Jackson and St. Philip;—ships chained for forty days; hospitals and hotels, for the sick and the well: wharves and warehouses, for unloading vessels; blankets and beds, boxes and bales, opened, fumigated, disinfected; swarms of officers; and an expenditure of millions! If New Orleans closes the door to all nations, will not all nations close the door to her? The published views of the latest writers on quarantine tell us, that, however healthy may be the crew and passengers, the air sealed up in the hold is saturated with contagion; no cleansing, no fumigation, no ventilation, will suffice, without unloading, etc. No vessel can dip her sails within the tropics—none can come from a yellow fever country, without being *suspected*, and *all the suspected* must undergo quarantine until the infected air is cured or killed—a fact which cannot be known *themselves*.

A true history of our epidemics would show that the *first cases* of yellow fever do not always, nor even frequently, appear in the shipping. If we adopt the logic of the contagionists, it would seem that the disease is not imported from the West Indians, *but from the Western and Northern States*; because the flat boatmen, and others that have just descended the river, are generally the first in whom the malady is seen, and therefore they must be its importers. Theory requires the yellow fever to begin in, and to spread progressively from, ships that have recently arrived, from places where yellow fever was prevalent. The villain Procrustes cut off all the legs which were no longer, and stretched those which were shorter than his bed. Such was his *theory* of length; and such is the *prestige* of contagionists when facts oppose.

* The ever blessed and adorable goddess Hygiea, daughter of Æsculapius, is our witness, that nothing is here intended to favor dirt or dirty people. The goddess of Health doubtless winks at “pious frauds” which have a tendency to promote cleanliness. And there can be no doubt that her father, Æsculapius, was far from being displeased with the New York physicians who invented the doctrine of *Septon*, which reigned at the beginning of the present century, not only in that city, but over half of the world, and which caused soap and water, alkalies and scrub brooms, liming and white washing to become fashionable. “Grim Septon” delighted in filth, corruption, and acidity, and would only be put *hors de combat* by alkalies. Dr. Mitchell gave accounts of this mischievous personage, in both prose and verse:—

“Your hands collecting, spread through every clime,
A fair proportion of attempering Lime.—
—The conflict o’er, behold on all sides round,
In *neatural* chains, the Powers of Mischief bound,
To lie in durance strict, ten thousand thousand years.”

Grim Septon appears to have been as well known in New York as Achilles was among the Greeks, or Satan among the infernals. It is very remarkable that *Septon* should call in the aid of *Oxygen* in getting up contagions, or rather miasms:—

—“Captivating *Septon* draws
Unwary *Oxygen* to aid his cause.”

Beginning with 1819, I offer two or more of the *first cases* of yellow fever, for twenty-one consecutive, though not all epidemic, years, in illustration of this species of evidence. The first cases almost invariably go to the Hospital, where records are kept by salaried clerks. I could have multiplied the cases ten fold, but deem it unnecessary. The last epidemics I have not touched, as they would occupy too much room.

No class of yellow-fever patients are so quickly or so generally sent to the Hospital as those on shipboard. It is, therefore, a matter of great surprise that so few persons from ships are found among the *first attacked*, and the more so as scarcely any of the crews of ships are acclimated. The following list will show that only about three in a hundred are sent from ships, either as pay or charity patients, in the early part of the epidemics. According to the theory of importation, *the ships ought to furnish nearly all of the first cases.*

YEARS.	NAMES.	PLACE OF NATIVITY.	LAST FROM.
1819.	Gifford	Wilmington, Del.	Philadelphia.
	Sandal	Sweden	"
	Leger	France	Attakapas, La.
1820.	Wood	Alexandria, La.	Alexandria, La.
	Woosman	Amsterdam	Amsterdam.
	Ornd	New York	London.
1821.	Hough	Portland, Me.	Boston.
	Burns	Ireland	New York.
	Gildan	"	Baltimore.
1822.	Jacob	Philadelphia	Philadelphia.
	Jack	Ireland	Havana.
	Cohan	"	Louisiana.
1823.	Foley	"	"
	Miller	Switzerland	Mississippi.
	Holden	Ireland	New Orleans
1824.	Hall*	Maryland	Red River, La.
	Prior	Sweden	Ship Cail.
	Hosman	Virginia	Steamboat Reigo.
1825.	Hays	Ireland	New Orleans.
	Allen	Pennsylvania	Steamboat.
	Harris	North Carolina	Keelboat.
1826.	Murphy	"	Terre Bœuf, La.
	Miller	Ohio	
	Kennedy	Ireland	
1827.	Williams	Connecticut	
	Crosgrove	Ireland	
	Kirk	England	Brig Majesty.
1828.	Hay	"	Steamboat Florida.
	Handly	"	Havana.
	Lighner	Germany	Vera Cruz.
1829.	Kingwell	England	Steamboat Ivanhoe.
	Bird	Pennsylvania	Cincinnati.
	Lepenard	New York	Havana.
1830.	Hereford	Virginia	Cincinnati.
	Boylen	Ireland	
	Delong	Virginia	
1831.	Cavener†	Ireland	
	Wainwright	North Carolina	
	Times‡	Canada	
1832.	Deen§	Ireland	
	Cousin	France	
	Rapp	Germany	

* There were but two cases in the Hospital this year. The physician who attended the lad, Hall, (aged 17,) made the following remarkable note: "A well marked case of yellow fever, removed to the Hospital with black vomit; taken out of a flatboat laden with hogs, at the mouth of the Red river, by the steamboat Eagle." Hall recovered! No epidemic followed! He took the disease at the mouth of Red river!

† The elder Dr. Ker made this note: "The first case of the kind this season."

‡ Dr. Ker's note declared that the dissection proved this to be a genuine case of yellow fever.

§ I find no other cases this year. Three deaths. Deen recovered. Were not four cases sufficient to have kindled up an epidemic, on the principle of contagion? The same question applies to many other years, in which a very few, but malignant cases, occurred in different parts of the city.

YEARS.	NAMES.	PLACE OF NATIVITY.	LAST FROM.
1833.	Cassady - - - -	Ireland - - - -	Wheeling, Va.
	Maily - - - -	" - - - -	St. Louis, Mo.
	Grant - - - -	Virginia - - - -	
1834.	Scales - - - -	Georgia - - - -	
	Delilah, D. - - - -	Kentucky - - - -	Louisville, Ky.
	Tracy - - - -	Ireland - - - -	London.
	Snow - - - -	Sweden - - - -	New York.
1835.	Wilson - - - -	Scotland - - - -	Texas.
	Graham - - - -	Pennsylvania - - - -	Pittsburgh.
	Ferral - - - -	Genoa - - - -	Vera Cruz.
	Williams - - - -	Denmark - - - -	New York.
1836.	M'Kenny - - - -	New York - - - -	Bayou Sara, La.
	Clayton* - - - -	Ireland - - - -	Mobile.
	Mayer - - - -	Germany - - - -	Tampico.
	Farland - - - -	Scotland - - - -	Pensacola,
	Guilman - - - -	Nantes - - - -	France.
	Brinkly - - - -	Pennsylvania - - - -	Ohio.
	Collins - - - -	Virginia - - - -	Texas.

YEARS.	NAMES.	PLACE OF NATIVITY.	PLACE LAST FROM.	LENGTH OF RESIDENCE IN NEW ORLEANS.
1837.	Meras - - - -	Italy - - - -	New York - - - -	2 months.
	Windham - - - -	South Carolina - - - -	North Alabama - - - -	24 days.
	Gohen - - - -	France - - - -	- - - - -	1 year.
	Mrs. Hairne - - - -	- - - - -	Texas - - - -	5 months.
1838.	Sidia - - - -	Sicily - - - -	- - - - -	4 months.
	Mrs. Cody - - - -	- - - - -	- - - - -	
	Curren - - - -	Pennsylvania - - - -	Albany, N.Y. - - - -	3 months.
1839.	Hemzog - - - -	Switzerland - - - -	Havre - - - -	3 weeks.
	Pew - - - -	Kentucky, - - - -	Natchez - - - -	
	Chillis - - - -	Italy - - - -	Baltimore - - - -	
	Kidney - - - -	Ireland - - - -	Cork - - - -	6 months.
	Hober and wife,	Switzerland - - - -	Philadelphia - - - -	2 years. 5 months.

DYNAMICAL TABLEAU OF IMMIGRATION.

A dynamical law of population in the United States, which I have deduced from a most laborious analysis of the decennial census of 1840, will throw some degree of light upon the vital statistics of New Orleans, and other cities of the South and South-west.

The law referred to shows that in the geographical distribution of ages there is a tendency to throw into the West and South-west an undue proportion of the young, among whom the causes of death are the most active. This must tend to reduce the average age. For how infirm and unproductive so ever the old may be, they contribute in a marked degree to extend the average life. Thus, four children dying aged one year, will, by means of one centenarian dying at the same time, have a mean life of 20.8 years each.

If I mistake not, the explanation of this dynamical law is to be sought for in the economy of immigration, which tends to leave the aged in their native land, as physically disqualified for the hardships incidental to new countries, new climates, and new enterprises. The immature class of immigrants, that is, the infantile, is not repelled, as in the case of the aged, since it is not doomed to hopeless decline and increasing disability. Hence, the British Government offers a free passage to emigrants to Australia, with support for ten days after landing, on the condition that they shall be adults and shall be able to labor, and shall not be more than thirty-five years old. The internal immigration in the United States, including that from foreign countries, flows to the West and to the South-west, and comprehends an unusual proportion of young fathers, mothers and children, who, oppressed with cares, poverty, and augmenting numbers, resign, in

* This man was not sent to the Hospital. I was called in during the last stage. Probably ten or fifteen died during the year, in the city and Hospital.

a great degree, the pleasures of society, for a home in the wilderness, or a temporary residence in Southern towns, where labor is rewarded with double or triple wages.

By the census of 1840, Michigan, Iowa, and Wisconsin, the centres in which the lines of migration converged most powerfully, had nearly twice as many children under five years of age as Connecticut, in proportion to the entire population. Michigan had one in every 5.58—Iowa, one in 5.96, and Wisconsin one in every 5.07; while Connecticut had but one in 8.09—Rhode Island one in 7.74 and Massachusetts one in 7.87, of this class.

If this hypothesis be correct, it will go far towards explaining the unusual proportion of centenarians in Charleston, as ascertained both by the census and the bills of mortality. It is probable that the natural increase of population in Charleston is antagonised by emigration from the city, the aged being generally left. According to the report of the register of that city, for 1844, the population was 29,963, (which is but 702 over that of the census of 1840,) and the mortality of the whites 553. Of these, 32, or 1 in 17 1-3 were aged from 60 to 70—31 or nearly 1 in 17 3-4, from 70 to 80—16, or 1 in 34, from 80 to 90—2 from 90 to 100—3 from 100 to 110—1 from 110 to 120. Here, the centenarians are as 1 in 138 1-4 of the whole number of deaths, being nearly three hundred and fifty times greater than in France; for in that country, in fifteen years, ending in 1832, during which period 11,793,289 deaths took place, only 25 were aged 100 years and over, that is, 1 in 471,731.

The mortality in Charleston for six years, ending in 1846, was 3,569. In this number twelve were aged from 100 to 110, and 3 from 110 to 120; or, 1 centenarian in 237, nearly—upwards of 1,000 times more than France.

This conclusion may be fortified by taking another route, namely, that relating to the geographical distribution of the very aged. For example, South Carolina, the richest of all the States in centenarians, has one centenarian in every 6,025 inhabitants for the whole State, and one in every 975 for its chief city, Charleston; while Indiana has but one in 29,508.1—Illinois one in 31,483.6—Missouri one in 40,408—Michigan, the same; and Wisconsin one in 42,924, and so on, with but few exceptions, chiefly relating to Rhode Island, (the poorest centenarian State) and to Louisiana, the richest in centenarians next to South Carolina. These discrepancies must give way, however, under the pressure of so many facts having a different import. Louisiana has a much higher ratio of children of five years and under than Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, Vermont, New York, Delaware, Maryland and the District of Columbia, with a slight increase over a number of other States; but Louisiana has a proportion considerably less than Mississippi, Arkansas, Missouri, Indiana, Illinois, Wisconsin, and some others. There are by the last census fifteen centenarians, or one in every 5,879 inhabitants of New Orleans. This class is probably furnished chiefly by the creoles, while immigrants supply a large number of the younger classes, that is, persons under ten years of age, amounting to more than one-fourth of the whole population, showing how, in some places, that extremes meet.

As there is no nation whose vital statistics is so dynamical and progressive, at least so far as number is concerned, as this Republic, so there is scarcely a town or settlement in which people do not desire to see an augmentation of the population. Hence, few are willing to allow that the locality in which they live is sickly.

Does the traveller inquire concerning the salubrity of a neighborhood, how sickly so ever the locality may be, its inhabitants give it a favorable character, but candidly acknowledge that certain other places, at some distance, are unhealthy; but on reaching these sickly spots, the same questions will elicit similar answers. While voyaging upon the Illinois river, in the spring of 1836, I witnessed a most violent altercation between a senator and a physician, strangers to each other. The latter was hastening back to the East, after having explored the western part of the State of Illinois—a portion which he pronounced unhealthy. This position happened to be within the senatorial jurisdiction of the former,—whereupon, the senator considered the matter as a personal affront. Had the steamboat not have been under way, a duel would probably have been fought. Having examined the same neighborhood a few days previously, I could testify that the doctor's report was not libellous, but true; indeed, the senator's constituents were very familiar with intermittent, and carried upon their pale, sallow countenances, *prima facie* evidence of bad health.

Dr. Daniel Drake, an acute observer, informed me, during his excursions through the Western and Southern States, a few years ago, that, when passing through districts where fevers, agues, and other epidemics prevailed, the people generally denied the unhealthiness of their own particular localities, but admitted the prevalence of sickness in the surrounding neighborhoods; but when he inquired in the latter places, they referred him to the former or some more distant spot.

The following anecdote is taken from the *Ascension Herald* of 1838: "We frequently hear," says the editor, "persons boast of the health of their several neighborhoods in very extravagant terms. A friend of ours living in the parish of La Fourche,"* (the most swampy and healthy part of the world,) "insists that no person was ever sick in his neighborhood, and that very seldom any person dies. He says that when the vicinity where he lives was first settled, the immigrants were generally very young, and had lived there so long without seeing any body die, that they did not know what death was. They did not travel much, or they might have been better informed in other places. He says that at last one man about one hundred and forty years old died, and that they could not imagine what was the matter with him, but kept him four days sitting in the chair, when some traveller passing told them the old man was defunct, and then they buried him."

The following specimen of legislation upon the mode of curing yellow fever in days of yore, will close this branch of our inquiry:

"BOARD OF HEALTH.

"SITTING OF AUGUST 31, 1824.

"WHEREAS a mode of treatment of the disease which manifested itself at Passage, when that place was occupied by the French troops, has been communicated to the Board of Health; and whereas it appears that that disease is the same that now exists in this city, the Board of Health ordains—

"That the treatment that was employed in the town of Passage shall be published in the two languages, in four of the newspapers of this city, during ten days; the Board of Health inviting the physicians of this city and of the State to use said mode of treatment, if they deem it proper.

"MODE OF TREATMENT OF THE DISEASE WHICH MANIFESTED ITSELF AT PASSAGE.

"The Surgeon-Major of the 19th regiment of light infantry, a man well acquainted with the principles of physiological medicine, ascertained that the principal seat of irritation existed in the stomach, and in the small intestines; he, in consequence, had recourse, at the first appearance of the disease, to the application of a great number of leeches on the epigastrium; to mucilaginous or gummous drinks, such as a decoction of barley, linseed marshmallow, or gum-water; to emollient clysters; to emollient poultices and fomentations, after the fall of the leeches, on the whole extent of the abdomen. Emetics, cathartics, general bleeding, bark, and internal stimulants, were entirely proscribed. At a more advanced period, sinapisms, and even sometimes blisters, were applied at the lower extremities. The result of that treatment was so successful, that it ought to obtain the preference over all others hitherto employed in the yellow fever. In some instances, it saved people who already began to exhibit the most alarming symptoms, and which until then had been considered as mortal."

CHRONOLOGICAL TABLEAU OF YELLOW FEVER.

On the present occasion, no attempt will be made to enumerate the different eruptions of yellow fever in New Orleans, much less to give the special history of each. The times when, and the places where it has prevailed, will be noted only in a comparatively few instances. The historical enumeration of New Orleanian epidemics, to be at all satisfactory, would occupy too much space—not that I would conceal anything as it regards the sanitary history of this city. Nevertheless, it is a great error to suppose that New Orleans is and has been the greatest stronghold of yellow fever. This disease, in New Orleans, has prevailed only for a short time, and has caused but few deaths compared with many other cities. The whole mortality in New Orleans since the first invasion of yellow fever, presents but a small fraction of that which has occurred in Spain in a single year. At the close of the last, and the beginning of the present century, fears were entertained that yellow fever would depopulate the entire peninsula of Europe.

The following tableau includes only a small proportion of the Spanish towns in which yellow fever has prevailed; the dates are subjoined:

* By the census of 1840, it appears that in this parish, 1 in 913 persons is aged over 100 years—250 times more than the average of France.

Medinia Sidonia—1801, '2, '12.

Malaga—1741, 1803, '4, '21.

Seville—1800, '1, '19.

Teres—1800, '19, '20, '21.

Carthagenia—1804, '10, '11.

Gibraltar—1804, '10, '13, '14.

Cadiz—1705, '31, '33, '34, '44, '64; 1800, '3, '4, '10, '13, '19, '20, '21.

The following data, taken almost at random from a large collection, will indicate the places and dates in relation to a part of the yellow fever epidemics in the United States:

Gordon (in his History of Pennsylvania, from its discovery to 1776) says yellow fever prevailed in Philadelphia in the year 1700,* (nearly a century before it appeared in New Orleans,) and quotes T. Story's statement concerning the consternation that prevailed in that city:—"Great was the fear that fell on all flesh."

It prevailed in Philadelphia in 1732, '41, '43, '44, '47, '62, '93, '94, '96; and subsequently, as in 1797, '98, '99, 1801, '2, '3, '5, '17, '20.

Boston—1693, 1795, '96, '98, '99.

New York—1702, '43, '48, '62, '91, '93, '98, '99, 1800, '1, '2, '3, '5, '19, '22.

Norfolk—1741, '47, '95, '97, 1800, '1, '21.

New Haven—1743, '94, 1805.

Baltimore—1794, '5, '7, 1800, '18, '21.

Providence—1794, '97, 1800, '5.

Pensacola—1765, 1822, '25, '41.

Martinico, Jamaica, Barbadoes, Guadeloupe, Sainte Croix, Antigua, St. Domingo, Vera Cruz, Havana, Charleston, Philadelphia and New York, have suffered more from yellow fever than New Orleans.

Yellow fever appeared in New Orleans in 1796,† just three hundred and two years after its appearance in the West Indies among the Spaniards who accompanied Columbus in his second voyage. Its name is legion. It would be tedious to enumerate the various names applied to it for several centuries. In less than twenty years after its appearance in the West Indies, its principal features had been described by several Spanish writers, as Oviedo, Herrera and Gomara. Dr. Noah Webster has proved that about this period, namely, 1618, some of the New England tribes of Indians had been almost entirely destroyed by this malady—three hundred only remaining of a tribe that had numbered 30,000! The whites found their skeletons strewed over the ground in and about their towns. The survivors described the leading features of the disease so as to leave no doubt of its true character. In 1635, Father Du Tertre and others described the yellow fever of Guadeloupe, as did the English who suffered from it at Carthagenia in 1641, and in Barbadoes in 1647. But black vomit, as a symptom of this disease, appears to have escaped the attention of observers, or was absent, until described by Father Du Tertre and others, near the middle of that century.

The yellow fever appeared in Boston 1693, and next year in Rochefort, (France,) more than a century before it visited Louisiana. About this period Father Labat's account of yellow fever at Martinique appeared in his travels, not to mention many other notices of a similar character by various writers. The stream of yellow fever literature now began to widen and grow deeper, from time to time, until the last twenty or thirty years. This fever has prevailed as an epidemic about fifty times in Europe. Before it appeared in New Orleans it had prevailed in Cadiz six times, in Philadelphia eight times, Norfolk three times, Charleston ten times, Baltimore twice, New York seven times, afterwards nine times, New Haven twice, Barbadoes eleven times, St. Domingo four times, Jamaica five times, Vera Cruz three times, Havana three times.

Charleston, desolated at the close of the 17th, and the beginning of the 18th centuries, had no epidemic yellow fever from 1703 to 1728. From that period up to 1755, no less than five epidemics visited this city, after which an exemption of 37 years took place, until 1792—but during 10 years, ending in 1802, eight epidemics occurred. The recent and now existing period of exemption

* Thomas Story's account relates to the year 1699, according to some authorities.

† One authority (Frasas) says 1795.

enjoyed by the Northern cities of the United States scarcely equals that which Charleston formerly enjoyed long after the first invasion of that city.

In the north temperate zone, yellow fever has been fully as frequent as in the torrid zone. In the south temperate zone it has not, as yet, prevailed to any considerable extent, until the year 1850, excepting in Pernambuco, lat. 7 deg. 20 m. S., in 1684, and in Guayaquil, lat. 2 deg. 11 m. S., in 1740. During the year 1850 it appeared for the first time, (and in its most fatal form,) in the city of Janeiro, nearly under the tropic of capricorn, and consequently on the confines of the south temperate zone. This advance of yellow fever upon the south temperate zone, is probably but the harbinger of its future invasion of the southern part of the continent, and of its decline in the north temperate zone. The sparseness of population, particularly of urban population, in South America, will probably render its march less obvious and less disastrous. No good reason, *à priori*, can be assigned for this migratory movement of the unknown cause of yellow fever. The only reason at all plausible that can be given, is an empirical, or rather historical analogy. The yellow fever cycle commenced within the tropics soon after the discovery of America. Its period of increment, comprehended nearly two centuries; its period of culmination; thirty-three years, extending from 1792 to 1825. Soon after it began to decline in Europe and in the United States.

Epidemic yellow fever has traversed in Europe nearly 46 deg. N. lat., as in Rochefort, (45 deg. 50 min.,) in the year 1694, and in America nearly 47 deg., (46 deg. 50 min. N.,) in Quebec in 1805. Its southern limit has been, within a few months, extended to the city of Janeiro, lat. 22 deg. 55 min. S. Hence, its entire austro-boreal range is 69 deg. 44 min., covering nearly seven parallels of latitude.

Without attempting to enumerate the exact number and places of epidemic yellow fever, it may be proper to state that it prevailed in places of note about as follows:

CENTURY.	TOWNS.
15th, - - - - -	3;
16th, - - - - -	5;
17th, - - - - -	35;
18th, - - - - -	150;
50 years of 19th century, - - - - -	150.

But as it respects this last estimate, it must be observed that by far the greater number of places visited by yellow fever during the last fifty years, were so visited in the early part of this century. The Peninsula and other parts of Southern Europe, once severely visited, are now nearly or quite exempt from the disease as are Boston, New York, Philadelphia, Baltimore, Norfolk, and many other towns, even those inland.

Hence, it may rationally be conjectured, that as this malady, after having reigned a longer or shorter period, in many places in the north temperate zone, and having gradually declined from the north towards the south, so in New Orleans, where it appeared at a comparatively recent period, it will, in like manner, soon cease. Many facts prelude this "consummation, so devoutly wished." Within and north of the northern tropic, the disease is less frequent and less malignant now than formerly, while under the southern tropic it is beginning to show itself.

All nature, at least all dynamical nature, is stamped with the laws of periodicity, and moves through cycles more or less obvious, having periods of increment and decrement. Magnetism is an example of regular, yet irregular periodicity. In 1576, at London, the needle pointed 11 deg. 15 min. east of north; in eighty-one years it had declined so as to point due north. It remained stationary five years. It then declined towards the west. In one hundred and fifty-three years its maximum western declination, amounting to 27 deg. 18 min., having been completed, it began to retrace its steps, sometimes slowly, sometimes rapidly, in its long, undefined magnetic century.

The *Aurora Boreales* have, independently of annual periods of increment and decrement, cycles of change still more prolonged. The earth itself, in its dynamic and climatic character, has its cycles; and those cycles, other cycles. Astronomers agree that it does not now pursue its former path through celestial space; that its orbit was once more elliptical than at present: that its eccentricity is diminishing; that it more and more approximates to a perfect circle, and that our planet must have been formerly nearer the sun, for a certain period of its revolution, than at

present. Climate has its periodicity; not simply that of day and night, winter and summer, but cycles of change of undefined duration. The polar ice, the accumulation of ages, encloses elephants, tropical animals and tropical plants; showing that a tropical sun once poured its genial rays upon the soil of Siberia, now frozen perpetually for hundreds of feet in vertical depth.

Epidemics, too, probably have their cycles, not the less real because little known. It is only since the art of printing that records of epidemics have assumed any degree of consistency. Of a comparatively late epidemic, THE BLACK DEATH, or THE GREAT MORTALITY, we know almost nothing, except that about the middle of the fourteenth century it destroyed in four or five years one-fourth of the human race. Hence historical comparasans and probable deductions cannot be made for want of facts extending over time sufficiently extended. That epidemics are governed by no laws, or by laws less fixed and certain than those that govern the solar system, cannot reasonably be admitted. Although these laws are and may ever remain unknown, yet from a large number of data many important results concerning epidemics will probably be eliminated by the doctrine of chance or probability; not that chance really exists—for the throwing of a die would appear to be what it really is, governed by laws absolutely certain if all the facts of the case could be known to the thrower.

ERRATA.

Page 4, 3d line from top, for "of the Ohio," read *to the Ohio*.

Page 4, 6th line from bottom, for "tends," read *tend*.

Page 5, 24th line from top, for "consumption," read *consumption*.

Page 7, 19th line from bottom, for "convention," read *conversation*.

Page 12, 1st line from top, for "following views," read *following facts*.

Page 12, 16th line from top, for "Graminea," read *Gramineæ*.

Page 12, 26th line from bottom, for "makes the most elevated," read *marks, etc.*

Page 14, 8th line from top, for "Posetta," read *Rosetta*.

Page 15, 6th line from top, for "gives a total," read *give, etc.*

A few other errors the critical reader may detect and forgive, the smallest of which is becoming common among printers, namely, "Bennett" for BENNET.

