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BOOKS AND PAMPHLETS RECEIVED.

Elements of Pathological Anatomy: By Samuel D. Gross, M.D.; Professor of Surgery in the Jefferson Medical College of Philadelphia; and formerly Professor of Pathological Anatomy in the medical department of the Cincinnati College. Third edition, modified and thoroughly revised; illustrated by 342 engravings on wood. Pp. 771, 8vo. Philadelphia: Blanchard and Lea. 1857. From Mr. J. C. Morgan, bookseller, Exchange Place, N. O.

On Diseases of the Skin: By Erasmus Wilson. F. R. S. Fourth American edition, from the fourth and enlarged London edition. Pp. 649, 8vo. Philadelphia: Blanchard and Lea. 1857. From Mr. J. C. Morgan, bookseller, Exchange Place, N. O.

The Practice of Surgery: By James Miller, F. R. S. E.; F. R. C. S. E.; Surgeon in Ordinary to the Queen, for Scotland; Surgeon in Ordinary to His Royal Highness Prince Albert, for Scotland; Professor of Surgery in the University of Edinburgh; Consulting Surgeon to the Royal Infirmary, etc., etc. Revised by the American Editor; fourth American, from the last Edinburgh edition: illustrated by 364 engravings. Pp. 682, large 8vo. Philadelphia: Blanchard & Lea. 1857. From Mr. J. B. Steel, bookseller, 60 Camp street, N. O.

Climatology of the United States, and of the Temperate Latitudes of the North American Continent, embracing a full comparison of these, with the Climatology of the Temperate Latitudes of Europe and Asia, and especially in regard to Agriculture. Sanitary Investigations, and Engineering, with Isothermal and Rain Charts for each season, the extreme months and the year, including a summary of the Statistics of Meteorological Observations in the United States, condensed from recent Scientific and Official Publications. By Lorin Blodget, Author of several recent Reports on American Climatology; Member of the National Institute, and of various Learned Societies. Pp. 536 royal 8vo. Philadelphia: J. B. Lippincott & Co. Trubner & Co., London. 1857. From Mr. J. C. Morgan. bookseller, Exchange Place, N. O.

The Effects of Climate on Tuberculous Disease: By Edwin Lee, M. R. C. S., London. Being the Dissertation to which the Fiske Fund Prize was awarded June 6. 1855.

The Influence of Pregnancy on the Development of Tubercles: By Edward Warren, M. D., of Edenton, N. C. Being the Dissertation to which the Fiske Fund Prize was awarded June 4, 1856. Pp. 73. 42 8vo. Philadelphia: Blanchard & Lea. 1857. From Mr. J. C. Morgan, bookseller, Exchange Place, N. O.

A Theoretical and Practical Treatise on Midwifery: including the Diseases of Pregnancy and Parturition. By P. Cazeau, Member of the Imperial Academy of Medicine, Adjunct Professor in the Faculty of Medicine of Paris; Chevalier of the supplementary number of the Order of Charles III; Member of the Surgical Society; Member of the Biological Society; of the Medical Society of Emulation; of the Anatomical Society; non-resident Associate of the Medical Society of Bordeaux; correspondent of the Society of Accoucheurs of Berlin; President of the Medical Society of the department of the Seine. Adopted by the Superior Council of Public Instruction, and placed by ministerial decision. in the rank of the classical works designed for the use of Midwife Students in the Maternity Hospital of Paris. Second American from the fifth French edition, by W. R. Bullock, M. D. With 140 illustrations on wood. Pp. 992, 8vo. Philadelphia: Lindsay & Blakiston. 1857. From Mr. J. C. Morgan. bookseller, Exchange Place, N. O.

Proceedings of the Academy of Natural Sciences of Philadelphia. Pp. 101 to 172; also a Notice of some remarks by the late Mr. H. Miller. Philadelphia. Pp. 19. 1857. From the Academy.

Transactions of the Medical Society of the State of Pennsylvania, at its Annual Session. held in Westchester, May, 1857. New Series, Part II. Pp. 218, 8vo. two maps. Published by the Society. Philadelphia. 1857.

The Hand-Book of Practical Receipts for Every-Day Use: A Manual for the Chemist, Druggist, Medical Practitioner, etc., etc. Comprising the Officinal Medicines. their Uses and Modes of Preparation, and Formulæ for Trade Preparations, Mineral Waters, Powders, Beverages, Dietetic Articles, Perfumery, etc.; with a Glossary of Medical and Chemical Terms, and a copious Index. By Thomas F. Branston. First American, from the second revised and enlarged London edition. Pp. 307, 12mo. Philadelphia: Lindsay & Blakiston. 1857. From Mr. J. C. Morgan, bookseller, Exchange Place, N. O.

A Case of Exsection of the entire Os Calcis: By J. M. Carnochan, M. D.; Surgeon-in-Chief to the State Hospital; Professor of Surgery in the New York Medical College, etc. Pp. 8; with two plates. New York: 1857.

The Transactions of the New Hampshire Medical Society, sixty-seventh Anniversary, held at Concord, June 2 *and* 3, 1857. Pp. 104. Concord: 1857.

Report of an Operation for Removing a Foreign Body from beneath the Heart: By E. S. Cooper, A. M., M. D. Pp. 8. San Francisco: 1857.

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THE NEW ORLEANS
MEDICAL AND SURGICAL JOURNAL

FOR JULY, 1857.

ORIGINAL COMMUNICATIONS.

ART. I.—*Historical and Statistical Observations on Cholera:* By BENNET DOWLER, M. D.

THE first great cholera epidemic, which commenced in India just forty years ago, progressed westwardly, with several haltings and irregular oscillatings to and fro. Its dynamical force or velocity was, for the most part, at the rate of one degree of longitude monthly, and having reached Paris, Quebec, and New Orleans in 1832, and Havana and Mexico in 1833, not to name other places, its consternating cycle of desolation seemed soon after to be nearly completed, although it still lingered in some places, and, subsequently prevailed with great severity, in Berlin, Naples, etc. In the meantime, at its original point of departure, in the East, many millions had fallen victims to its ravages.

After ten years of comparative exemption, epidemic cholera reäppeared in India in 1843, and pursuing, as previously, its westward route, it reached Russia in 1847, and central Europe the year following, as will appear in the sequel.

In realms occidental cholera has been, in its features, marches, oscillations and temporary declinations, identical with that of the Orient, where it has long reigned as the supreme destroyer—the impersonation of Death.

Cholera, in our day, is what the "*Great Mortality or the Black Death*" and the "*Sweating Sickness*" were in the fourteenth, fifteenth and sixteenth centuries in the old world. Compared with yellow fever itself, cholera appears to be the more formidable of the two, and, although a newer pestilence, it has severely smitten the present, and will probably descend to after generations.

At an early period in the second decennium of the nineteenth century, thanks to the British practitioners in India, descriptions of this monster-malady were given, so faithfully and graphically, that throughout its western progress in Europe and America, physicians were able to recognize it at once, though prejudice, interest, and the wish to escape a visitor so unwelcome, have often combined to produce popular incredulity for a time, until the truth became too overpowering to admit of contradiction.

Upon the Ganges and the Euphrates, the Nile and the Volga, the Seine and the Mississippi, the Garrone and the Tagus, the Rhine and the Guadalquiver, the Rio Grande and the Sacramento—at Alexandria, Moscow, Warsaw, Berlin, London, Paris, Lisbon, Rome, Naples, Madrid, Montreal, Quebec, New Orleans, St. Louis, Havana, Mexico, and places too numerous to mention, this malady has presented no marked diversity under the most varied conditions of climate, topography, civilization and race.

Epidemic cholera is virtually a new disease. Anterior to the early part of the fourth decennium of this century, it was practically unknown in the West, although descriptions of, or allusions to it, may be traced in the ancient authors, including Celsus.

If this disease had ever prevailed in Europe, until recently, medical historians, to say the least of their short-comings, have failed to transmit to their posterity complete histories of its character and movements. These omissions of our predecessors place them in an unfavorable contrast to the numerous epidemological writers and historians of the nineteenth century. Even as late as the eighteenth century, little or nothing has been left on record in this behalf, excepting a few notices, which are meagre, vague, and altogether unsatisfactory.

The non-prevalence of this malady as an epidemic, except in a few regions, at the present, and its occasional recurrence in isolated cases along its late routes, indicate this as a proper time to review its past and prepare for its future, it may be, impending invasions, and the more so, because its cause, pathology, and treatment are little understood, although in this behalf, the present paper promises nothing new or satisfactory, beyond a few suggestions, including allusions to facts of a significant character.

A knowledge of the pathology of cholera is an important point of departure for the study of a vast number of kindred maladies of the stomach and bowels, which cause a large proportion of the current mortality of every country and climate. If the field of experience, though extensive, has produced but a scanty crop, is this not a good reason for renewed effort to accumulate or review facts in order to comprehend their import? Facts may be destitute of novelty, but who can say that they are without utility, either present or prospective, explicable or otherwise? To agitate, to reïnvestigate, and to seek the truth are duties required of the physician.

That epidemic spasmodic cholera should have been for centuries almost exclusively Asian in its *habitat*, or that it should have extended westwardly to Europe and America a quarter of a century ago, no one has been able to explain satisfactorily. For ought that science can say, it ought to have originated and reigned upon the banks of the Mississippi or the Amazon, and have passed thence to the Nile, to the Euphrates, to the Indus, to the sacred Ganges and to the plains of India.

The beginning of the historic period found civilization in the Occident, the glories of which at length faded away. A long and still pervading darkness settled in the East. In the meantime, the arts, sciences and religion progressed to the West, where they fixed their abode many centuries ago, and where they shone, and still shine with increasing brightness. Is not the law of compensation operative herein? If the East imparted its blessings of civilization to the West, has not the former desolated the latter with the greatest pestilence ever known, namely, the Asiatic Cholera, which marches in the face of the wind, over burning plains, snow-covered hills, morasses and treeless and waterless deserts?

The Black Plague of the fourteenth century pursued the same westering path as did the cholera of the present century. The deteriorating influences of the latter not only continue, but, like a smouldering volcano, occasionally break forth into epidemics, as of late in southern Europe and South America.

It rarely, if ever, happens that epidemics, as those of cholera, influenza, the plague, and epidemic small-pox travel from continent to continent eastwardly. Is there not some cosmic cause for this, which has hitherto eluded ætiological research? May not the diurnal or annual dynamics of the earth in its path through space be concerned in giving this direction to the material and direct cause of epidemics?

Influenza, *la grippe*, or catarrhal fever, which many regard as the invariable precursor of cholera, is, of all epidemics, the most rapid, frequent, and all-pervading, and withal, its history has been more fully or at least more frequently recorded during the last four centuries, than, perhaps, any other epidemic. Influenza appears to have lost much of its malignancy, not its universality, during the cholera æra. Anno 1580, influenza raged throughout Asia, Africa and Europe, with a malignity approximating that of the plague. Its progress has been generally, like that of cholera, westwardly.

The English National Cyclopædia says that "this disease has often visited London with great severity. In 1729 it was very fatal in London. Lowe says that more persons died of it than at any one time since the plague of 1665. One thousand died weekly of it in the month of September. In 1847, its fatality was also very great, considerably above one thousand weekly dying for many weeks together." Nevertheless, this disease in modern times seldom proves fatal. Whether it be always a forerunner of cholera is questionable. It certainly is not always followed by cholera. Their apparent relations, ætiological and pathological, are however, worthy of a thorough investigation. Both have their principal seats in the mucous tissue, the one in the respiratory—the other in the gastro-intestinal membranes. Their topographical dynamics and the simultaneity with which both attack vast expansions of territory, afford a remarkable parallelism; while, on the other hand, their symptomatic phenomena and their pathological finalities not only fail to exhibit any appreciable analogy, identity or connection as cause and effect, but stand out in strong relief as antithises.

It may be proper in this place to glance at their possible affinities, as deducible from the mortality statistics of the United States for the year ending with the 30th of June, 1850, which show, that among 323,023 deaths from all causes, 253 resulted from influenza, or about 1 in 1,300. The influenza proved mortal chiefly in the spring. Much more than half of the cholera mortality occurred in the summer. Thus, by transferring 200 deaths from the list of 331, the season of which was unknown, and adding this number to that of summer, this season is chargeable with 18,443 deaths from cholera, out of 31,506, for the whole year. In this year, at least, the maximum mortality of influenza was directly followed by the maximum mortality of cholera.

A few remarks upon the affinities between cholera and other kindred affections, may here be added. It will be seen, upon analyzing the mortality statistics of the United States for the year ending June 30th, 1850, that in the spring, when cholera gave only 1,636, diarrhœa gave but 652; but when, in summer, cholera gave (as corrected) 18,443 deaths, diarrhœa had increased about threefold, that is, to 1,766. In autumn, when the cholera had declined to 9,869, diarrhœa had still gone on increasing to 3,176, or nearly five times greater than either the spring or winter mean. Hence, diarrhœa was minimized before the cholera was fully developed. Diarrhœa increased rapidly with the increase and during the declination of cholera. Both diseases were repressed in nearly an equal ratio during the spring and winter.

The parallelism between dysentery and diarrhœa is remarkable, the former sustaining the same dynamical relation throughout the four seasons, as the latter did in regard to cholera, the maxima of diarrhœa and dysentery being postponed to the autumnal season. This topic will probably be resumed in another page.

Whether there be any precursory disorder of the stomach and bowels before the irruption of an epidemic cholera, as well as before an individual attack, is not easily determined by exact and extensive statistical data extant, though the affirmative of this question has been prevalent, and is probably not well founded. Derangement of the alimentary canal is common during cholera, even among those not attacked by the epidemic in the usual form.

It is doubtful whether the ordinary causes of mortality, other than bowel complaints, are less active after the prevalence and subsidence of cholera. Bowel affections are often among its sequelæ as already stated.

The influence of cholera upon all the causes of mortality for the fourth, fifth and current decennial periods of the present century, as compared with the first, second and third, is a problem deserving of statistical investigation.

The data which have been or will be enumerated, appear to show that the ordinary causes of mortality are more active during the prevalence of cholera than at other periods, particularly in reference to causes seated in the alimentary canal. Thus, for example, in the epidemic cholera of New York in 1849, in Philadelphia in 1848–9, and in most other cities wherein data have been recorded, diseases of the bowels, other than cholera, marched with the latter, often in an almost equal pace, rising, in New York, from 28 per week to 297, averaging 250 deaths for eight weeks, during which cholera was at its culminating period. In New Orleans in 1848–9, diseases other than cholera increased with the increase of the latter.

It is believed that, if time permitted the making of an extensive numerical analysis of the New Orleans bills of mortality year by year, it would appear that neither 1847 nor 1848, anterior to the irruption of cholera, was remarkable for the fatality arising from bowel-diseases at least.

In 1849, the number of deaths from cholera in New Orleans, was, according to the official report, 3,176, which is nearly one-third of the total mortality for that year, without including cholera morbus, 109 ; diarrhœa, 234 ; dysentery, 335 ; cholera infantum, 40. These latter amount to 719.

Throughout the year 1850, cholera prevailed in the city to considerable extent, with the exception of the summer months, the mortality from which was nearly half as great as that of the year preceding. During autumn, it suddenly appeared in the city of Sacramento, California, destroying, according to Dr. Logan, in twenty-eight days from the 19th of October, 364 person in a population of six thousand, a ratio of nearly one in sixteen.

It has been often asserted, that the fear of cholera is a principal cause of exciting it and of rendering it mortal. But on the other hand, it may be said with more probability, that fearlessness of cholera and the consequent neglect to attend to its first symptoms are very common, and much to be deplored. Besides, the insane, who have no fears of the disease, are the most liable to suffer and die. In the alms-house of Baltimore, in 1849, where ninety-nine, more than one-sixth of the inmates, died of cholera, *all* of the insane of the lower story, seventeen, died.

The malignancy of cholera does not appear to be augmented in a ratio to the density of the population. Indeed, in many country places, on plantations, and in villages where the disease has appeared, the proportional mortality has often exceeded that common to great cities. The recent epidemic in France was severest where the population was least dense. The routes to California, through vast prairies, arid deserts, and mountainous regions, are strewed with the bones of emigrants who perished from this disease a thousand miles from houses, homes and crowded, filthy cities.

The opinion which has been expressed by some practitioners of ability, that cholera never attacks an individual a second time, is, according to my experience, erroneous. On the contrary, in some cases at least, one attack during an epidemic, if it should not predispose to another during the same or a subsequent epidemic, affords, for the remainder of life, no immunity. During the first and second great cholera epidemics, (1832, 1848,) I have known two, three, and four attacks in the same individual—though such examples are very rare. Indeed, some persons, owing, it may be, to some peculiarity of constitution, who have suffered one attack, ought to be doubly cautious upon the appearance of another epidemic. May not one attack of this disease leave, in some constitutions, a choleraïc diathesis analogous to that which an intermittent fever leaves in many cases? The difference between cholera and yellow fever, as it respects susceptibility to subsequent attacks is great. The latter affords a protection which the former cannot.

Does one epidemic afford protection to a community against the frequency, universality, and fatality of subsequent epidemics? This question which should perhaps be answered by, *No*—deserves a more thorough investigation than the limits of this article will permit. Yet something may be said on the other side of this question.

In New York, the second great epidemic, that of 1849, was much less fatal, or rather less general than the first, namely, that of 1832, and the same is true of New Orleans, Paris, and some other places, both in America and Europe. The first cholera epidemic at Paris, destroyed, according to the official report, 18,402, while that of New Orleans was incomparably greater in proportion. Some calculations represent the mortality from cholera, in Paris, as more than the double of that here mentioned.

The cholera lingered long in Paris in 1854, but its aggregate mortality was small as compared to former epidemics, or to certain small towns, villages, and isolated dwellings in certain rural districts. But a small mortality generally represents in the vocabulary of cholera, a small number of attacks.

The statistics of the cholera which prevailed in 1854–5 upon the western coast of Africa, and Asia, and in central, southern and peninsular Europe, and that now prevailing in Demarra, have not been fully reported, or if reported are not accessible. Hence the behavior of cholera as compared to its former invasions, in both urban and rural localities, might be difficult to ascertain definitely by reliable statistics.

The treatment of cholera may be here alluded to, not with a view, however, to illustrate its *methodus medendi*, but in order to glance at its bearings in a numerical and historical point of view, without following an exact chronological order and without giving copious data.

The mortality statistics of cholera will show, it is believed, that the *methodus medendi*, has been little improved since the first cholera invasion. In the hospitals and almshouses (*hospices civils*) of Paris, the ratios of the deaths to the attacks, in 1832, 1849 and 1854, for each 100, were 47, 55, and 52.

In 1855, in Vienna, among 5,500 officially reported cases of cholera, half died. Whether the ratio is higher or lower in the United States is not easy to determine, as the statistical data in this country are not obtained by that rigid governmental procedure which obtains in some European countries, as in France, Germany, etc. In the cholera of 1848–9, the discharges from the Charity Hospital of New Orleans numbered 735, the deaths 1,122, for this disease. In 1850, the discharged cured, numbered 189, the fatal cases 530, from cholera in this institution.

In 1849, the population fluctuated in St. Louis, from 70,000 to 50,000, in which number 4,557 died of cholera, the whole mortality from all causes having been 8,603.

In 1848, cholera prevailed in St. Petersburg; by the 24th of June, one thousand cases had occurred, more than half of which proved fatal. Three months later the number of cases had multiplied to nearly 26,000, while at Moscow, the cases exceeded 16,000. In the meantime, "in the Russian dominions in Europe, amongst a population of 54 millions of persons, 1,427,836 cases of cholera had been reported, 570,700 of which had terminated in death, 792,591 had recovered, and 64,545 remained under treatment." In St. Petersburg and Moscow, according to the then current reports, more than half of the cases ended fatally, while at Cairo, the proportion of deaths to the cases was incomparably greater.

France, the United States, peninsular and southern Europe, have suffered from cholera more, in proportion to population, than densely populated Great Britain. The first cholera cost France 95,000, while, in three years from the invasion of the epidemic, the number of victims in Great Britain was but 30,000, which is much below the number for one year in the United States, as reported in the mortality statistics for the year commencing with the 1st of July, 1849, during which 31,506 died of cholera.

The third invasion of Paris commenced at the end of the first week in November, 1849. It reäppeared in 1853. In Paris, New Orleans, and many other places, the returns of cholera as compared to its first visit, have proved less destructive, because less general and extensive. But the proportional mortality to the number of cases has undergone no marked deviation!

If the treatment has been neither more successful nor fixed, the universality of the later invasions of the epidemic has been considerably limited as to the number of attacks. This limitation is, however, more apparent than real, for, although at many places, the number of attacks at any one time during the last ten years may, be less than during the year 1832, yet for these last ten years in Europe, and nearly as long in America, cholera has often been epidemic and perpetually sporadic to some extent, so that there has, in reality, been no great preponderation of exemption in favor of this latter period. Thus the first cholera of New Orleans, the most severe that ever visited the city, killed its thousands, and soon died out itself, and was almost forgotten until 1848, since which it has prevailed several times, every year having presented sporadic cases. On the day of writing these lines, late in May, 1857, I have heard of several cases. Moreover, during the last ten years, the small towns, villages and plantations, have suffered more than formerly—more, at least, than the large cities themselves, particularly in France.

Sanitarians have not yet explained, by means of their theory, why London, which to a great degree, lies flat upon the alluvium of the Thames, in some places below high tide; why London, often enveloped by fog, always in smoke, being withal the largest and most densely inhabited city in the world, is at the same time one of the most healthy—one where cholera is the least severe. Had this disease prevailed in that city as it has often prevailed in towns and on plantations in the United States, a single epidemic must have swept away three or four hundred thousand souls in a few days. Public sanitary measures in that city date long subsequent to the cholera invasion.

In dwelling on these numerical details, as illustrative of the history and treatment of cholera, without wishing to over-rate the efficacy of medical treatment, it may be proper to say, that statistical evidence is, and must be far more unfavorable to the skill of the medical faculty in appearance than in reality. Seeing that statistics show that half of the cases of cholera prove fatal, it may appear presumptuous and false, to assert that in a great majority of cases, cholera may be cured by simple means, provided that all cases of diarrhœa during epidemic cholera be considered and treated as cholera. What is usually considered cholera erroneously excludes this, its first and curable stage. Its advanced, and generally incurable stage, in which medicine cannot be retained, or if retained cannot be absorbed, or if absorbed cannot often cure, is that which alone is designated as genuine cholera. Of either the fully developed or the collapsed stages of this disease, M. Magendie's definition is scarcely an exaggeration: "Cholera," said he, "begins where all other diseases end, that is, in death and cadaverization." The first treacherous stage, lasting perhaps but one or a few hours, may deceive the physician himself, as it has tens of millions of the entombed,

"From Indus to the Pole."

Here, again, reservation and qualification will be necessary, inasmuch as it will be found, that the so-called premonitory or diarrhœal stage, which often lasts many hours and sometimes days, does not, as was once supposed, invariably and for a considerable time precede, fully developed cholera. This disease is sometimes so suddenly developed, the primary purgings are accompanied with sinking, pulselessness, coldness, cramps, asphyxia, and a speedy paralysis of the absorbents. The number of these deplorable cases has been greatly underrated, as I had ascertained from observation in New Orleans. While writing this page, the British and Foreign Med. Chir. Rev. was received for April, 1857, from which it appears that the celebrated micrologist, Prof. Lebert, of Zurich, in his recent work on cholera which prevailed in Switzerland, shows the absence of this premonitory or prodromic diarrhœa, in the epidemic of 1854 and 1855, in fully one-third of the cases. This, however, is not the general rule, but the exception, as statistical data will show.

The first as well as the second great invasion of cholera in the western hemisphere, seems to indicate that its cycle is seldom completed in a single season, its deleterious influences continuing with more or less intensity biennially or triennially, or longer. In the east, where it seems to have been indigenous for ages, it raged during the last year in several districts of India, and the Cape Verde Islands, outliers of tropical Africa.

The second cholera, that of 1848, lingered longer, though it was less mortal than that of 1832, and like the latter, extended itself through the rural population, where on many plantations its malignancy was incomparably greater than it was in the city.

The appearance of cholera in the city of New Orleans, has hitherto been a precursor of its advance upon the rural districts. In 1832, as well as in 1848-9, these urban prodromes manifested themselves.

Surgeon Lawson, U. S. A., now Surgeon-general, was resident in this city in 1832. In his Army Report he says, that New Orleans was the first and last point attacked: "So fearfully rapid was the pestilence in its progress, that in less than forty-eight hours it reached the lowest plantation on the Mississippi, desolating almost every spot inhabited by man. In the State of Louisiana, the epidemic exhibited itself in its most malignant character."

Yellow fever and cholera, though apparently in no wise necessarily connected, may exist in immediate succession, or even simultaneously blending with as well as displacing each other.

The second quarantine report upon cholera, presented to parliament in 1852, says, "Dr. Gavin states, that cases occur during the yellow fever epidemic now prevailing in Demerara,* some of which have come under his own observation, in which the symptoms simulate those of cholera so closely, that, in a cholera epidemic, they would be called cholera." Now, although the symptomatic differentiæ of these diseases are in New Orleans well marked, the presence of the one malady does not imply that the other is absent or not impending.

In the autumn of 1832, cholera appeared for the first time in New Orleans, as an epidemic during the prevalence of yellow fever, destroy-

* The recent mails, May, 1857, bring intelligence from Demerara, that cholera still prevails in that colony.

ing in a few days, according to Dr. Halphen's elaborate report, one-seventh of the entire population; others report 7,000, and some as low as 4,000 deaths from cholera alone.

In 1832, yellow fever commenced on the 22d of September. On the 15th of October it was declared epidemic. Ten days later cholera appeared. Dr. Halphen, whose ashes now repose in the Catholic cemetery, was then a practitioner in New Orleans, and the French Academy, who reported very favorable upon his book, adopt his account, and style this a double epidemic, ("*la double épidémie de fièvre jaune et de choléra.*") In treating this double epidemic, Dr. Halphen found that the antiphlogistic mode which he adopted for the cure of the fever developed the cholera, whereupon he reversed his mode of treatment. With the increase of cholera the fever receded.

Dr. Lawson, then senior surgeon of the army at New Orleans, now Surgeon-general, who was himself a sufferer from this epidemic, says in his official report, that "in the city, the victims of cholera numbered about 6,000, the population being perhaps 55,000."

Surgeon McMahon, U. S. A., resident at New Orleans, in his official report for the three months ending with August, 1833, says: "The yellow fever, or *rather a complication of this disease and cholera*, appeared shortly after the subsidence of the latter. Amongst the citizens, the average mortality from it has been about seventy per day up to this time." Thus 1832 and 1833, as well as 1848 and 1849, were years in which both cholera and yellow fever prevailed in New Orleans.

Without in the remotest degree intending to examine into the causes to which cholera has been attributed, it may be allowable to give, without adopting, the following hypothesis by an ingenious writer—a theory which, however, did not originate with him, but which, in the opinion of not a few able thinkers, is the most probable one yet advanced.

"No conditions of physical change in the atmosphere itself," says Sir Henry Holland, "are known to us—statical, chemical, electrical or other—which afford even a plausible explanation of the pheuomena of cholera. The earliest Indian official reports furnish nothing that can be admitted as proof to this effect; nor have the later and more exact observations of Europe better warranted the opinion. No notion of an epidemic constitution (to acquiesce for a moment in a phrase thus vague and doubtful in import) can be of avail against the facts belonging to the history of the disorder—its course, manner and time of progress, and various aspects—as it has spread over the world during a period now nearly forty years, since the occurrence of the earliest known cases at Jessore. The whole resolves itself into this: that the disease in its most distinct and virulent form, has existed in different places under every possible variety of atmospheric state; and, conversely, that every such variation has existed in a higher degree in the same places, and at all times, without producing the disease. Nor have we the smallest reason, from knowledge or analogy, to assume that any gaseous, mineral, or vegetable matter, diffused in the atmosphere, or exhaling from the earth, could create a disorder thus peculiar, or spread it in a manner to remarkable over the face of the globle. The notion of terrestrial or mineral exhalations, is defective in proof in every case, and singularly inapplicable to the cause and circumstances of cholera. A natural morbid cause or causes, (for which, in default of a better, we must admit the name of *malaria*) may originate locally, and produce various local endemic or epidemic diseases; and of this we have sufficient evidence. But these very circumstances of limitation directly exclude any agent, so generated, as the source of a migrating disease, to which we are unable to assign boundary or limit. Equally inapplicable for the same reasons, is every theory founded on the temperament, habits, food, or other conditions of particular communities. The history of cholera, as followed through different countries and climates, and races of mankind, negatives at once all suppositions of this nature; nor need we follow them beyond the mere statement. Whatever be discovered hereafter, as the cause of the disease, it must be one which has come into existence and active operation within the last thirty-eight years; and which, therefore, cannot possibly depend upon conditions long before existing without the production of any such effects."—(*Med. Notes*, 3d. ed. 1857, pp. 464 *et seq.*)

This able author rejects wholly all existing theories of the origin and diffusion of cholera but that of "animalcule life," ("invisible forms of organic life" "removed from direct observation,") which he advocates as the most rational hypothesis. Here he finds or assumes a "*material poison*" having "*the faculty of reproduction.*" Of course "invisible organic forms," that is, swarms of invisible insects would run or fly the most potent quarantine with more facility than visible ones, such as mosquitoes, grasshoppers, and locusts, and the more so as they are, analogically speaking, erratic in their flights, habits and instincts. If these migratory swarms of insects, diffused over millions of square miles, or in patches, could be proved to be the forerunners of cholera, their connection with the latter as its cause would be probable, instead of being as now, wholly conjectural. Of the assumed deposits of *ova* and their vivification and choleraïc sequlæ, nothing has been proved by the aforementioned baronet, who, nevertheless, is an acute reasoner, and consequently, offers this hypothesis as a hypothesis only.

A few general observations upon the supposed contagion of cholera, how inconclusive soever they may be in this regard, will not, it is hoped, be useless, in a statistical point of view, as a development of facts which should not be forgotten.

Cholera in 1848, appeared almost simultaneously at Paris, New York, New Orleans, Memphis, the army on the Rio Grande, St. Louis, and other places, as well as on the Atlantic ocean, among emigrants voyaging from Europe to America. The difference in time did not, perhaps, vary more than ten or fifteen days. On the very day the Board of Health of New Orleans decided that cholera was epidemic in the city, that is, on the 21st of December, 1848, the disease raged among the U. S. troops on the Rio Grande, and in seven or eight days nearly half of the command died. (Dr. Jervis.)

This simultaneity of invasion over land and water, seas and continents, is not characteristic of ordinary transmission from person to person, while it is characteristic of epidemicity, as in influenza, dengue, etc., as will more fully appear hereafter.

If cholera be contagious, the multiplication of railroads and other intercommunication must spread it from its foci, over the entire country with great celerity, and the same remark applies equally to yellow fever and such other diseases as contagionists include in this category. The absolute quarantine of railroads for forty days, still more than ships and boats, will be necessary when any of these maladies shall attack any place on a railroad. New Orleans quarantines against foreign and *à fortiori* against domestic contagion, and, consequently, the people on the railroads and rivers of the valley of the Mississippi ought to adopt the same logic and conduct as it respects New Orleans.

Internal as well as external quarantine should be required and enforced by consistent contagionists. The first cases of cholera should not be sent, as is now the custom, to the Charity Hospital, to communicate a contagious disease to nearly a thousand persons in the hospital as patients and their attendants. Nor should individuals be allowed, at pleasure, to visit patients affected with cholera in private houses, and thence to disseminate a mortal contagion over the city. Special hospitals are required for contagious diseases. In both hospitals and private dwellings, isolation of the patient and exclusion of visitors, are essential as means of preventing the extension of contagion.

If the simultaneous action of cholera over vast expansions of territory, be contrariwise to that of diseases due to personal contacts, or aërial emanations from the sick, so is the occasional but well proved *per saltum* or jumping course of cholera, seeing that in traversing a district, it repeatedly leaps over one or more neighborhoods to attack others, where personal intercourse could be neither proved nor reasonably expected. A leaping propagation of cholera is not easily explained upon the commonly received malarial theory.

The geography of malaria, of insect life, and of cholera do not coincide in time or place. Cholera has proved severe amid Siberian snows and Scandinavian winters with a temperature thirty degrees below the freezing point, as well as among the supposed malarial regions, as the immense morasses of the Ganges and the Mississippi, which simmer in the hot sun a hundred degrees above zero, and which, too, give life to an exuberance of insects.

Cholera contagionists ought to show the sincerity of their faith and the consistency of their logic by quarantining in all directions, as well against internal as external contagion from intercommunication, seeing that cholera has existed every year, perhaps, either epidemically or sporadically for a quarter of a century, in certain districts and towns in almost every State of this Republic. A case of cholera from Pittsburgh, Cincinnati, Louisville or St. Louis, should no more be admitted into New Orleans by the downward navigation by the river, than by the upward navigation from the sea. Rational quarantine has no up, no down, no north, no south. Neither contagion-bearing goods nor persons are admissible, not even daily tons of mail-matter. The transmission of contagion from New Orleans *to* other cities is a different yet not less reprehensible practice.

Dr. Byrne, a most rigid contagionist, in his late book on cholera, says that "there was not a case of this disease in the United States in 1849, previously to the arrival at New Orleans of a passenger ship from Havre, and one at New York," etc.* These ships were the New York and the Swanton. The former left Havre November 9th, and arrived at New York city December 2d; and the latter left Havre November 2d, and arrived in thirty-nine days at New Orleans, December 11th, 1848. No cholera existed at Havre when these vessels sailed from that port.

These two vessels, the supposed carriers of the second epidemic cholera to the United States, have not only served as points of departure for contagion, but for an exuberance of unnecessary argumentation—unnecessary, because, as will be presently seen, there were sources or

* An Essay to prove the contagious character of Malignant Cholera; with brief instructions for its prevention and cure: by Bernard M. Byrne, M. D., Surgeon U. S. Army; 2d Edit. 1855. A notice of this work of a talented but *ex parte* writer was given in this Journal a few months ago.

foci of well developed cholera in the country at that time, as well as previously.

The English Board of Health, in its report to parliament, in 1852, on the epidemic cholera in 1848 and 1849, has searchingly inquired concerning these supposed contagion-bearers to America, and concluded (as others have) that,

"When they left Havre, cholera was unknown there. No manifestation of the disease had then presented itself in all France. It was committing its ravages in various portions of middle Europe, and had extended nearly to the western confines of Germany, but as yet it had not crossed the Rhine, nor developed itself in a single place in the French territory. The passengers, it is true, were Germans, but they had been domiciliated at Havre for two or three months previous to their departure, and were finally provided with the means of leaving that port by a charitable donation made up for the purpose. They were then placed on board of these ships in a very wretched condition, and suffering from all the privations of poverty and want. They were paupers without means, and dependent on the kind offices of charity for their passage. In what condition they went on board it is quite easy to imagine. The 'New York' had 331 of these poor creatures in her steerage, and the 'Swanton' 280, besides their cabin passengers and crews. No evidence of the existence of the disease manifested itself until these vessels had been many days at sea, and then immediately upon the occurrence of some remarkable atmospheric phenomena."

Dr. Byrne is mistaken in saying "that there was not a case of cholera in the United States in 1849." That was a great year of epidemic cholera. Even 1848 was not exempt from cholera anterior to the arrival of the above mentioned epidemic-bearing ships from Havre. The New Orleans Board of Health reported a fatal case of cholera which occurred between the 19th of August and the 21st of October, 1848. (See this Journal for November, 1848.) The late Dr. Hester, then editor of this Journal, in the March issue of 1849, adduced evidence of the existence of cholera six days before the arrival of the Swanton.

Without going extensively into the statistical history of 1848, it may be proper to mention a few of many data, showing that if cholera be contagious, there was no need to assume its importation as essential to its diffusion in 1848 and 1849. In the January number of this Journal for 1848, the list of deaths includes one from cholera.

Drs. Ames and Boling at the meeting of the Alabama Medical Association, held at Selma, March 8th, 1848, reported a death from cholera in the city of Montgomery. D. Francis Condie, M. D., chairman of the committee of Practical Medicine for the American Medical Association for 1848–9, quotes and adopts the report of Drs. Talbot and Yandell in the Western Journal of Medicine and Surgery of February, 1848, showing that cases of genuine cholera had occurred in January of that year, in the practice of most of the physicians of Louisville, and, consequently, nearly a year in advance of the arrival of the New York and Swanton, the supposed carriers of the second great epidemic. According to the official statistics of Massachusetts for 1848, the mortality from cholera amounted to 46. The assertion that there was not a case of cholera in this country in 1849, before the arrivals of the Swanton and New York, is erroneous in date, as in 1849, cholera existed epidemically or sporadically in every State of the Republic, as the following data will show.

The following will show whether "there was not a single case of cholera in 1849." These data are not offered simply to refute this statement, but for their intrinsic value in illustrating the geographical dynamics of cholera in that gloomy and eventful year. A glance at the map in connection with the statistics of cholera for that year, will show the erratic course of the epidemic along the great lines of travel diverging from New Orleans, as that of the North-west, and that of the North-east. The latter line, through Alabama, Georgia, the Carolines, etc., suffered very little, the former route severely.

According to the mortality statistics of the Seventh Census of the United States for the year commencing with July, 1849, the deaths from cholera amounted to 31,506. During the same year, cholera morbus, cholera infantum, diarrhœa and dysentery gave a still larger aggregate, so that these allied diseases reach a total of 65,946, much more than one-fifth of the aggregate mortality from all causes for the year, which amounted to 323,023.

During the year reported in the above mentioned census, the mortality from cholera in Louisiana reached to 2,940; Mississippi 587; Arkansas 245 ; California 404 ; Missouri 3,589 ; Illinois 2,059; Indiana 1,418; Iowa 134; Michigan 140; Ohio 5,808; Kentucky 2,030; Tennessee 858; Wisconsin 232; Minnesota Territory 5; New Mexico Territory 7; Utah Territory 82; Oregon Territory 0; Alabama 69; Georgia 17; South Carolina 69; Florida 26; North Carolina 36; Virginia 795; the District of Columbia 27; Maryland 166; Delaware 97; New Jersey 686; Rhode Island 159; Pennsylvania 1,296; New York 5,882 (city 1,742); Connecticut 60; New Hampshire 47; Vermont 31; Massachusetts 1,082; Maine 206.

As already stated, the dynamical affinity of cholera for the great highways and rivers and western longitudes, is frequent though not constant. Its leapings are irregular and enormous. The first great epidemic cholera had almost died out in the West, when it reäppeared fourteen years ago in India, without having passed from person to person, from town to town, in an eastern direction, across the vast territorial expansions of America, Europe, Africa, Western Asia, and the intervening ocean, seas, and isles. If cholera is caused by emanations from the sick, its propagation, east or west, would be expected to take place with equal facility and celerity, agreeably to all the known facts and analogies of contagion, upon which quarantine laws are based.

The General Board of Health in their second report to Her Majesty on quarantine, say: "With respect to epidemic cholera, we have shown in our first report, by a body of evidence which has not been impugned, and which is generally admitted to be conclusive, that whether this disease be contagious or not, quarantine has had no influence whatever in checking its progress, and that wherever, in the recent course of this pestilence throughout Europe, quarantine was put in force as a measure of prevention, it was speedily abandoned as useless and even mischievous.

"On the first irruption of this pestilence into Europe in 1831–2, every nation successively menaced by it, endeavored to bar it from passing its frontier, by rigorous quarantine and by military cordons, but in every instance without avail. Again the like attempt was made in 1847–8, and again it was everywhere admitted to be utterly ineffectual. Though many medical men in Great Britain had long ceased to place confidence in these expedients, yet the constituted medical authorities appeared still to regard them in some degree as securities; but founded on recent experience, the Royal College of Physicians of London have changed their former belief, have declared an opinion in accordance with that previously expressed by the general Board of Health, and have recorded their conclusion in the following words:

"'Cholera appears to have been very rarely communicated by personal intercourse, and all attempts to stay its progress by cordons or quarantine have failed. From these circumstances, the committee, without expressing any opinion with respect to its contagious or non-contagious nature, agree in drawing this practical conclusion, that in a district where cholera prevails, no appreciable increase of danger is incurred by ministering to persons affected with it, and no safety afforded to the community by the isolation of the sick.'"

Of the utility of "quarantine in preventing the ingress of cholera into any particular country or locality," Sir Henry Holland says, "that it is wholly ineffectual—a judgment amply confirmed by the evidence of facts. The practical conclusion is one of great importance; but it will be long, I fear, before we can expect it to be generally adopted and acted upon."—(*Notes*, 1857.)

The question of the contagiousness of cholera, including its complemental one, that is, its prevention by quarantine, derives new importance from the action of the recent quarantine convention held in the city of Philadelphia, on the 13th of May, 1857.

Had that convention adopted as a fundamental principle of its organization, the utter exclusion of individuals holding lucrative offices dependent on the perpetuation of quarantine, together with their special appointees, as ineligible, having pecuniary interests at stake, or had these latter recused themselves as is usual in such cases, the vote affirming the contagiousness and importability of cholera, typhus and yellow fever, would have left the question of contagion, as applying to these diseases, just as it stood before, having but a small fraction of the profession in the affirmative, and this too, only theoretically; yet even these, in practice, follow in the footsteps of the non-contagionists! It is notorious that the faith of the most rigid contagionists "is without works." In New Orleans, at least, faith "*per se*" predominates: for neither the first nor the last cases of these diseases, which recently have received the *imprimatur* of the convention as contagious, are ever separated and sent to special pest-houses. The sick either remain at home, or go to the great hive of the invalid and sick, the Charity Hospital, but in neither event is seclusion nor non-intercourse practised. Wherein is domestic contagion a whit better than imported? Of what avail is quarantine seventy miles below or seven miles above the city, if these diseases, already in the city, are permitted to diffuse themselves unrestrained, from person to person, from square to square? Is not an evil which already exists, more to be dreaded than one which only impends, or is but a bare possibility? Without separation, a sporadic case of cholera or yellow fever may be expected to spread the disease indefinitely if it be communicable.

The logic of contagion as to cholera, yellow fever, etc., is subjected to an infinite variety of incompatible, contradictory, indefinable criteria, as contingent contagion, local conditions, atmospheric changes, filth, trade, personal intercourse, etc., singly or combinedly. Hence all reasoning hitherto, now, and to the end of time has proceeded, now proceeds, and will proceed in a circle until this all-comprehending, self-stultifying and ever changing method of ratiocination shall be replaced by exact definitions, facts, types, standards, and fundamental principles, without which no certain progress can be expected. For more than a quarter of a century, a diluted logic has prevailed. Compared with the first quarter of the current century, the logic of the present day, including self-contradictory legislation, may be styled a steady progress into increasing darkness. Cholera is contagious, but not so *per se!* At one time infection, at another personal emanation, at another filth, at another atmospheric, or astral, or terrene, or subterrene conditions, will be alike fully accepted, not as contradictions, but as lucid demonstrations of a positive contagion, the *vera causa* of either isolated cases or expansive epidemics! Even in the small matter of the vocabulary, it is becoming very common to confound the words infection and contagion.

The late quarantine convention in Philadelphia, whose proceedings have been published in the public journals, affords an example of the modern method of reasoning and deduction, as set forth in the two, not to name any other resolutions, which, having been reported by the committee, passed unanimously, and were inaugurated as the fundamental principles of the conventional platform: namely, "1. *Yellow fever is not contagious, per se.* 2. *That it is only propagated in a foul or infectious atmosphere, analogous to that which gave it birth.*" Yellow fever is contagious or it is not; the phrase *by itself*, *per se*, being surplusage or a "damnable iteration." The second proposition contradicts the first: "Yellow fever is *only* propagated in a foul or infectious atmosphere." Hence it is not contagious at all, not being propagated from person to person, as all acknowleged contagious are. That it is wholly devoid of this power of propagating itself from person to person, is a conclusive opinion against its contagiousness, vouched for by the convention. The vote did not stop here. It is declared that "foul air gives it (yellow-fever) birth." Another theory is here propounded, and another contradiction is given to the first proposition. Can yellow fever be born before its life-giving parent, "foul air?" But waiving this impossibility, and admitting that it is born before its parent, and that it has the power of creating itself, why cannot it procreate and propagate "*per se*" without an incestuous union with its parent, the "foul air," which is the "only" agent by which it is "propagated?" Why uselessly assume, contrary to the recognized rules of philosophy, more causes than are required to explain the phenomena? Is it conceivable that *yellow* fever howsoever begotten, has no quantity, no quality, no essence, no ontology, no action, no symptomatic property, not even *yellowness*? If yellow fever be contagious, why should not contagion inhere in "yellow fever *per se*," rather than in that which is not yellow fever *per se*, but something else, something remote, external, and in nowise similar to itself? To attribute the birth and propagation of any malady to "foul air only," is precisely what is called *infection*, and is in every particular the antithesis of contagion, as every dictiouary will show. Worcester, in his dictionary, thus defines "INFECTION: Act of infection, the propagation of disease through the medium of the air, *distinguished from contagion.*"

Notwithstanding a decadency in medical logic, like other periodical calamities, is much to be deplored, mother wit, sincerity, and consistency of conduct, will command the respect of all, not excepting opponents. The vote of twenty medical and non-medical persons, in favor of absolute or contingent contagion, being in itself an abstraction as much as a vote in favor of an earlier spring season, could only become meritorious by including, defining and enforciug practical measures, such as the actual method of disinfection ; the best disinfectants for both persons and things ; methods of ventilation, fumigation, heating, refrigerating, or otherwise purifying goods, as cotton, wool, silk, furs and other principal carriers of contagion ; the goods and ships that should be burned; the goods to be unshipped ; ware-housing; pest-houses for each contagious disease; the transmission or the exclusion of the mails and passengers to and from centres of contagion; the natural history of "fonl air" (the foulest being that imported into New Orleans, not from the sea, but by the river, in boats which carry chickens, horses, hogs, sheep and cattle); whether the hogs that die of "hog-cholera" may be safely eaten? Whether the Governor of Louisiana,* who is governed by the Board of Health, is right in his proclamation now in force, which limits the quarantine to ten days detention instead of forty, the classical and accepted number? Whether the mayor of Charleston,† whose proclamation fixes "thirty days strict quarantine against all vessels from ports south of the latitude of Savannah," is wiser than the Governor of Louisiana?

By the way, it is remarkable that the existing quarantine in Louisi-

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**Proclamation by R. C. Wickliffe, Governor of the State of Louisiana.*—WHEREAS, by the thirteenth section of an act of the Legislature of this State entitled "an act to establish quarantine for the protection of the State," approved March 15th, 1855, the Governor is required, upon the advice of the Board of Health, to issue his proclamation, "declaring any place where there shall be reason to believe a pestilential, contagious or infectious disease exists, to be an infected place, stating the number of days of quarantine to be performed."

Now, therefore, upou the advice of the Board of Health, I hereby issue this, my proclamation, declaring Rio Janiero, South America, to be infected with contagious disease; and all vessels, together with their officers, crews and passengers, arriving from said Port o' Rio Janeiro, or having touched or stopped thereat, shall be subject to a quarantine of ten days.

Given under my hand, aud the seal of the State at Baton Rouge, on this 17th day of April, A. D. 1857, and 81st year of the Independence of the United States of America.

By the Governor: ROBERT C. WICKLIFFE.

ANDREW S. HERRON, Secretary of State.

†*Quarantine at Charleston.*—The mayor and port physician of Charleston, S. C., have given notice of the strict enforcement of their quarantine regulations. After the 1st of June, all vessels from ports south of the latitude of Savannah, where yellow fever either usually or occasionally prevails, will be required to remain at quarantine thirty days.

ana is solely directed against "vessels arriving from the port of Rio Janeiro," while, at other places, cholera or yellow fever has been and still is prevalent, as at Demerara, Bahia and elsewhere.

The report of the select committee of the Senate of the United States on the sickness and mortality on board emigrant ships, reported August 2, 1854, by the Hon. Senator Fish, chairman, adopted and five thousand extra copies printed by the government, (pp. 147, 8vo.,) sets forth "that this miasm [of typhus] attaches itself to every thing that it touches—to clothing, bedding, furniture and the walls of apartments—by which it is absorbed, and becomes more virulent in its action in proportion to the length of time during which it is permitted to remain. It is stated upon the highest authority, that this poison may last in 'fomites' for six months, and even for two or three years." The contradiction here advanced, that the poison grows stronger in proportion to its age, yet lasts only from six months to three years, is as excusable as some other prevalent samples of logic; but the data upon which this Senatarian decision is founded, including the sanitarian measures required, as area, ventilation, diet, purification, etc., were altogether worthy of investigation, or of an opinion at least, by a quarantine convention bent upon the prevention of diseases, by determining the practice as well as the fundamental principles essential to the promotion of health throughout this Republic.

If fever and cholera contagions permeate the very walls of apartments and the timbers of ships, growing more virulent for six months or three years, is not the Louisiana quarantine against Rio Janeiro alone, too short by three years, minus the "ten days?" Can such contradictory conclusions flow from facts, from reliable criteria, from the inductive philosophy? The *Patres Conscripti* at Washington, in their *Senatus Consultum*, did no more than report what the Æsculapian oracles had uttered, one of which is put in capitals thus: "ONCE INFECTED, ALWAYS INFECTED, UNTIL DISINFECTED."

Mr. McCulloch, a quarantinist, author of the celebrated Dictionary of Commerce and Navigation, justly says in his article on quarantine, that "during this period [forty days] all the goods, clothes, etc., that might be supposed capable of retaining the infection, are subjected to a process of purification. This last operation is the most important part of the whole quarantine system. There is not, even in the Thames, a lazaretto where a ship from a suspected place may discharge her cargo and refit: so that she is retained, frequently at enormous expense, during the whole period of the quarantine; while if she have perishable goods on board, they may be very materially injured." It is probable, that at no port in the United States, are the fundamental principles of the recognized system of quarantine carried fully into practice, as it regards disinfection, isolation, detention for forty days, etc.

The public press announced in the winter, that Mr. Samuel Hough, of the United States coast survey, died of yellow fever at Key West, on the 14th of January, 1857. Here the danger of contagion was more imminent than that from the remote city of Rio. The cholera, which within a few months has been decimating the armies of Nicaragua, Costa Rica, and other portions of South America, with which New Orleans has intercourse, would seem to be quite as dangerous as Rio.

If "foul air" be the originator and propagator of cholera, it is not philosophical to assign any other; yet it is easy to conceive, and probably the conception is in many instances true in ætiological science, that a disease may originate from a composition of causes, neither of which taken singly is sufficient, neither of which must be absent, and all of which are essential to the resultant, namely, the "birth of the disease." Now it is impossible that cholera should be one of these elementary causes, seeing that it is, upon this view, the direct effect of several essentially conjoined causes. The cause of a disease, whether it be an emanation from the sick, or from a deleterious combination of earth, air and water, external to the human body, is not identical with the conditions favorable or unfavorable to its propagation or retardation.

Although in commencing this article, it was not intended to enter upon the questions of contagion and quarantine, yet "the logic of events" and their great importance to the public welfare, suggested the propriety of the slight analysis above given, and will it is hoped, justify the extension of this paper beyond its intended limits; and should it contain any repetitions, the reader will excuse them, as one part was in the printer's hands, while the writing of the residue was in progress or not yet finished.

ART. II.—*Clinical Lecture by the late Dr. Drake.*

[COLUMBIA, Texas, April 24, 1857.

DR. DOWLER: *Dear Sir:*—Inclosed you will find a copy of an Introductory Clinical Lecture delivered in the Louisville Marine Hospital, by the late Prof. Daniel Drake to the class of 1845–46. It was taken down by myself at the time, and as everything from him is valuable, I send it to you that it may be perpetuated.

Yours respectfully, GREENSVILLE DOWELL, M. D.]

MODE OF EXAMINING A PATIENT.

You should in your examinations, inquire of your patient as follows:

First. Of what country a native? His age and occupation. Secondly. How long has he been sick? Whether he has ever been sick before? If any of his relations have had the same disease before? especially, if the disease be a hereditary one. What medicine he has taken? How did it act?

In the next place, you should commence your examinations with the external appearance of the body or configuration. 1st. See if there be any prominences or depressions and mark their situations and nature. Note whether the patient be corpulent or hypertrophied or debilitated, or of a feeble constitution.

2d. Observe the color of the skin. If it be of a yellow-brown color, you may infer that something is wrong about the biliary apparatus, and that the liver is not in a healthy condition. If the skin be of a pale livid color, you may expect some disease or derangement of the circulatory apparatus, either of the heart or blood vessels; or that the blood is imperfectly aërated.

3d. You should examine the alimentary canal, beginning with the mouth. If the tongue be coated with a dark scurf, or scaly, with tumefaction of the gums, with dark deposits of matter on the teeth, we may infer the patient to be typhoidly disposed. Again, if the tongue be red and dry, with a good deal of thirst, there may be inflammation of the stomach, or duodenum, or liver. If the tongue be covered with a thick, slimy coat, you may be sure the system is very much affected, and that the disease is of a debilitating and malignant character, and you may apprehend the worst consequences.

Proceeding with your examinations, you depress the tongue with some wooden instrument, and observe the organs exposed in that situation, whether there be tumefaction of the tonsils and uvula. Feel or make pressure on the skin, over that part, and you will discover if there be inflammation or not.

Next comes the stomach. If there be soreness of the epigastric region on pressure, with nausea, heat and thirst, and pain following eating, there will be inflammation of the mucous membrane of the stomach, and so on to the rectum, varying your examinations according to the part of the canal.

Then you should turn your attention to the respiratory system. Make your patient sit erect. Take off his clothes. Now make him bring a long breath; notice whether it gives him pain or not. Whether it produces cough. Pay attention to his voice when he speaks. Notice whether it be bronchial or natural. Now commence and make percussion, first, from the clavice to below the sternum, about half way between the sternum and the spine, and then on the opposite side in the same manner, noting the different sonnds ; secondly, at the back, beginning at about opposite the same point as before, proceediug down the back between the spine of the scapulæ and the vertebræ.

Take pains, in your percussions, to strike with the ball of your fingers, raising them immediately. Then apply your ear, with a towel or something of the kind between it and the body, closely applied, or with the stethoscope. Note the consequences. If the sound be loud, upon percussion, and the respiratory sound be bronchial, and the vesicular be absent, there will be hepatization of the lungs, and so on, making your diagnosis according to the physical signs.

While you are using the ear or the stethoscope, make the patient count or speak in monosyllables ; make him congh ; observe if it gives him pain. If he expectoratc, observe whether it be pus or mucus.

Next in order is the nervous system. Beginning with the nerves of sensation or the five nerves of the external senses ; first, the eye. If there be insensibility to light, we may infer that there is congestion of the brain from apoplexy, or effusion of serum or lymph, from inflammation. Again, if there be great irritability of the nerves from light, there may be inflammation of the brain that has not proceeded to a termination by either effusion of serum or lymph. The same examination with respect to the sense of hearing. These all noted, you should proceed to the spinal marrow. Make pressure along its whole extent. If there be pain upon pressure, you may infer that there is inflammation somewhere in its course.

We next examine the vascular system. Examine the pulse. If it bc full and strong, with hot skin, we say there is fever. If it be incompressible and wiry, with heat and pain, we say there is inflammation of some organ, and should we bleed, we will find the blood to have a superabundance of red globules, with a buffy coat and cupped. We notice whether there be congestion of any organ, such as the heart, lungs, liver, spleen, or the general capillary system ; whether there is a state of collapse or depression. Lastly, we observe the secretory apparatus. First, the saliva ; second, the gastric juice ; third, bile ; fourth, urine ; fifth and lastly, the fæces. If there be a profusion of saliva, there may be some hard irritating substance in the month of the patient, or he may have taken too much of some preparation of mercury, which has produced ptyalism. There may be too grcat a secretion of the gastric juice, and it may bc of an acidulous naturc, producing indigestion. Bile may be secreted in too great a quantity, aud produce dark and irritating discharges, or it may be suspended, and the fæces will be white and dry, or of a costive nature, that is, producing costiveness, with imperfect digestion, flatulency and colic. There may be too great a secretion of urine, producing diabetes, or it may be stopped by inflammation of the kidney, which will give an odor to the perspiratory matter, and to the breath by the effete which it is in the habit of carrying away, getting or remaining in the blood.

The fæces are a valuable means of diagnosis. If they be white or clay-colored, or greenish, there will be some derangement of the biliary organs. If they be mingled with undigested matter, there is derangement of the stomach and tributary organs. If they be hard and dry, we may infer that there is inflammation in some part of the tube, etc.

ART. III.—*On the Influence of the Mind on the Origin, Course, and Termination of the Diseases of the Body:* By ALF. MERCIER, D. M. P.

WE shall attempt in the following lines, to appreciate the influence of the moral affections on the origin, course and termination of the diseases of the body. For this purpose we shall at first allude briefly to some notions of physiology, and having rapidly shown how, in the state of health, the mind acts upon the body, we shall proceed to determine how far, under a pathological point of view, the same relation exists between our mental faculties and material organs. Our endeavor will be to avoid metaphysical disquisitions, and confine ourselves as much as possible to the compass of facts.

The heart is a muscular organ, a kind of living pump, having the property of alternately dilating and contracting. Its final destination is to push the blood through all our system as far as the external surface of the skin, and thus diffuse life everywhere. It generally contracts, or beats as we say, about sixty or seventy times a minute in adults. This most important machine, this source of existence itself, can however be influenced by the impressions of the mind ; even the least moral cause will disturb the harmony of its motions. How quickly and strongly, for example, does it beat in the young girl who makes her first appearance in the world. Look at that man, on the contrary, who receives a letter bearing bad tidings ; in proportion as he reads his face turns pale, his heart stops—he faints.

It has ever been remarked that the closest sympathy existed between the mind and the digestive powers. The ancients, who excelled in hygienic matters, recommended reading as a good preparation to the pleasures of the table. It is a matter of fact, that a few well written pages on a pleasant subject, at the same time that they cheer and repose our mind, do certainly excite and facilitate our gastric functions. If the gay companions of a banquet eat more than at their usnal home repasts, it is owing not so much to the change and variety of dishes, as to the absence of all serious preöccupations. Do you want a man to take a scant nourishment? force him to eat his meals in the silence of solitude. It is very probable that some consideration of this kind prompted the rule which enjoins to each monk of the Carthusian Order to eat apart in his own cell. Who of us does not remember with what increased appetite he took his food at college, when on some occasion of solemnities or patriotic anniversaries the pupils were permitted to speak at table.

One single example will suffice to show the effect of the impressions of the mind on our secretory system. The ball of our eye is kept in a constant state of moisture by a small gland located at the upper part of its socket. The fluid furnished from this source is absorbed and carried away by two canals in proportion as it flows. Bnt if from one cause or other the action of the gland is increased beyond measure, large drops or tears, as they are called, will be seen coming down along the cheeks. Nothing has more power than grief to produce this phenomenon, and those tears depend so much upon an afflicted state of mind, that as soon as we see them, we naturally conceive secret sympathies for the moral sufferings which they betray.

It is a vulgar saying that indignation or anger donbles the muscular strength of man. Innumerable facts could be brought forth to justify this popular assertion. Among the most striking ones is that well known incident which happened some years since in England. A man of delicate constitution had a daughter whom he loved tenderly, she being the sole comfort of his life. All on a sudden she disappeared. For years the poor father roamed all over the conntry in search of his beloved child. At last he discovered her on the platform of a monntebank: her manners had become cynical and her language was that of a conrtesan. To rnsh to the ignoble Hercnles standing by her, to crnsh him down under his feet and leave him a corpse, was the affair of a minnte for the desperate father. But if a sentiment of strong exaltation can raise the mnscular powers to such a point, feelings of an opposite kind will reduce them almost to nothing. There is nobody who has not experienced the extreme debility which emotions of a melancholy natnre leave after them.

The closest connections exist between the nervous system and the mind. It seems as if the nerves were the least material organs of our body. From the brain and spinal marrow they spring like branches from a common trunk, divide into infinite ramuscules alternately carrying sensibility to and from all the parts of the living frame. So exquisitely impressive are they, that in the eyes of some philosophers, life and even our soul itself is but an effect of their action, in the same manner as a musical sound results from the vibrations of the instrument which is played upon. The relation between the nervous system and the mind being so intimate, no wonder if the impressions of the latter so easily reflect upon the former. We shall hereafter have occasion to notice how often to moral causes is to be referred the irregular course which some diseases are seen to follow. But let us at first establish some truths which will lead us to an easier understanding of the mind's intervention between the trials of the body.

It must be acknowledged that in medicine as in other departments of science, the same one effect can be produced by very different causes. Every one knows that the effluvia arising from marshes give birth to the intermittent fever. Though this fact has been contested, we think it a well demonstrated one. Now it is not less true that the same kind of fever can also be brought on by catheterism, by the secretion of the milk, and by any strong affection of the mind. This is very remarkable indeed. Here we see the same disease produced by three different, nay, one would say, jarring causes. If, then, the affections of the mind can generate the same morbid phenomena as the miasmatic poison or the catheter, why should they not as well create other pathological disorders?

Grief, as we have already said, has direct and prompt effect on the digestive functions. The stomach, says Hippocrates, is to man what the soil is to the plant. It is the great reservoir whence all the different parts of our organism receive their nourishment. If it is altered in its functions, the whole body feels it; the fund of life becomes reduced, the power of reaction fades away, and then that fatal predisposition to sickness, which every one bears in himself, predominates and calls forth the invasion of morbific agents.

That troubles of the mind have a power to vitiate the fluids of our economy, is fairly proven by what takes place in mothers suckling their infants. Emotions of all kind, deep sorrows, violent vexations, modify and alter the secretion of milk. A professor of the school of Paris, known by his researches on the diseases of young children, relates that he knew a very impressionable lady, who, during the summer, became extremely nervous as soon as the atmosphere was filled with electricity.

If in those circumstances she gave the breast to her baby, it immediately showed intense agitation, which went so far as to terminate in convulsive spasms. Taught by experience, she kept her infant from the breast as soon as she was warned through her own sensations of the approaching danger, and the infant has never since been subject to convulsions. But there is another fact reported in the British annals of Medicine, which shows in a far more impressive manner, how quickly the milk of woman can acquire the properties of poison. A soldier being in a quarrel with a man, drew his sword, when the wife of his adversary rushed to him and wrested the weapon from his hand. Soon after this stirring scene, the woman presented her breast to the lips of her baby, then in a perfect state of health. No sooner had it taken some mouthfuls, than it writhed in agonies of pain and died.

Reasoning analogically, why not admit, since the affections of the mind can change in so much the nature of the secretion of milk, that they can modify likewise the other fluids of the human body. But whether they bring on diseases of the body by vitiating its humors, or by disturbing the harmony of its functions, or by depressing its vital powers, this is ever a great question proper to inspire the man of science with the desire of further researches. As for the fact itself, of mental causes creating sickness of the body, it seems to us to be undeniable, undisputable. Our intention never was to give here a full catalogue of instances calculated to illustrate this truth. We even leave aside a whole pathological class in which the moral influences play so prominent a part. It were indeed almost superfluous to recall to mind that it is the passions that oftenest produce the various forms of insanity. Insanity in its turn reacts upon the organs, and in a great many cases the *post-mortem* examination shows material lesions, either in the brain and its dependencies, or in the abdominal viscera.

There is a disease perhaps more hideous and more deplorable than insanity itself; a disease which renders those it tortures quite miserable, by keeping them in a perpetual state of dread and self-horror. The man subject to it possesses his full reason, and yet he knows that from one moment to another, he is exposed to lose it completely, and fall into such convulsions, as will to him, look more frightful than death itself. Every one in this description will recognize epilepsy. This awful neurosis has been ascribed to various causes; but from the latest and most accurate statistics, it results that three times out of four, it is to be attributed to fear. Thus a simple moral commotion has the power to act on the human organism, so as to make it harbor an evil which puts medicine at defiance, and often accompanies its victim into the grave.

Military physicians have all remarked the influence of the mind over the wounded after great battles. When large armies have been engaged in one of those memorable fights, upon which depend the destinies of an empire, we can easily imagine into what prostration both of mind and body, will fall the bleeding soldier, who sees that all his courage could not save the independence and honor of his country. Elated with joy and pride his triumphant enemy looks with confident heroism at his own mangled limbs, and anticipates the acclamations with which the crowd will greet him on his return in his country. The result of this difference in the moral dispositions on both sides, is that the wounded of the vanquished camp die in larger numbers; for to the sick, high spirits are a reviving balm, despondency a deadly poision.

Physicians of earlier times had already remarked how much the human body is liable to be pathologically influenced by moral affections; and among the various facts which antiquity has transmitted to us in illustration of this truth, there is one so applicable to our subject, that we beg leave to bring it in.

Erasistratus was attached, as physician, to the court of Seleucus Nicanor, king of Syria. It happened that Antiochus the son of that prince, became enamored of the fair Stratonice, his stepmother. His deep, concealed passion, reacting at last upon his body, he was seized with a violent fever, the cause of which Erasistratus did not at first perceive. But it was not long before the attentive and sagacious physician remarked, that whilst the young prince remained indifferent before the other wives of the king, the symptoms of his disease would undergo extraordinary changes as soon as Stratonice entered his room. He at once detected the origin of the prince's sickness, and foresaw the possibility of its cure. He went to the king. "Sire," said he, "your son's disease is one that leaves no hope." "No hope," exclaimed the king, "how is it possible?" "You will readily understand it, Sire, when I tell you that your son has fallen in love with my own wife; and I am not the man to satisfy his heart at so dear a cost." "O, Erassistratus," said the king, throwing his arms around the physician's neck, "wilt thou refuse that which can save a son I love so tenderly?" "Sire," replied the physician, "put yourself in my place: would you part with Stratonice if the young prince loved her?" "Ah! would to the Gods," said Seleucus, "the recovering of my son depended upon this; I would with all my heart give him Stratonice and a portion of my empire." "Well then," answered Erasistratus, "there is no one but you who can save Antiochus, and there is no other means of preserving his life than to make Stratonice his." Seleucus immediately declared his son king of Upper Asia, and gave him Stratonice in marriage.

We readily confess here, that when we began to study medicine, we were very far from suspecting how much the disturbances of the mind were capable of generating sickness in the body. We were somewhat inclined to believe that the assertions of authors on this point, savored a little of the marvelous. But besides that, our incredulity rested on mere prejudices, we were unwilling to be deficient in respect and consideration towards names so highly revered in the annals of the medical sciences. We therefore resolved to ascertain if we could confirm by our own observations and for our own personal satisfaction, what others had long since established as indubitable truths. For this purpose we availed ourselves of our position in the hospitals of Paris, which gave to us a fair opportunity to get into the patients' confidence. Most of them were poor, unfortunate creatures, very prone, indeed, to open their hearts to any one that seemed disposed to take their troubles into consideration. We were soon convinced that diseases proceeding from moral causes are of the worst kind. They have a tendency to follow an erratic course, and assume that peculiar ataxic form which indicates that life itself is shaken to its innermost depths. In cases of this sort, remedies have little effect, for the morbid cause remains ever acting, ever opposing its power to theirs. But we wished to go further, we wished to see, as it were, this cause begin to work in our presence and give birth to diseases in the hospital itself.

Just opposite the buildings of the Paris school of Medicine stands an old monastery, which has been transformed into wards for patients. The rooms for the confined women are close by a service of surgery and halls for dissection. Now it can hardly be imagined what havoc death makes there among those poor women. The scourge which sweeps them away has been attributed to the miasms arising from the neighborhood. Certainly to be placed in such a pestilential atmosphere cannot be altogether inoffensive. But this is not the greatest cause of mortality among those wretched creatures; for death is seen to prevail almost in the same proportion among the confined women at the Hospital of Cochin, the healthiest one in Paris. We were naturally led to search if those unfortunate victims did not bear in themselves, some particular circumstance that could explain how it was that they should die in such large numbers, whilst other women in the city went successfully through their confinement. It was not long before we found that all, with but few exceptions, were not of Paris, were not married, and that the infant they had brought to the light in the hospital was their first one. More consequences derive from these three facts than it could be imagined at first sight. Let us see how things generally follow their course with these wretched young mothers. The history of one is the history of all. Here is a girl who has betrayed the confidence of her parents, and exposed her family to shame and despair. She is betrayed in her turn and abandoned by her seducer. What can she do? Time presses upon her, she is not able to conceal her fault any more. Will she brave the contempt of public opinion? No, she flies to Paris, leaving a desolated family behind her, carrying in her own heart the pangs of remorse. Her little money being spent, she finds herself without a home, without a friend, alone in that immense Paris. How will she pass the interval which separates her from her confinement? She would work: but who cares to take a person in her position to service? Here begins a series of deceptions and mortifications, a real agony of mind. At last, the forlorn and worn down creature is admitted in the hospital. That solemn and terrible hour has come, when at the point of becoming a mother, she feels how much comfort she would derive from her mother's presence. She looks around and sees but unknown faces. Is there any thing in the world more cruel for a woman than this? The poor, unfortunate creature at least believes there is nothing worse than this; and yet the morrow undeceives her. Her infant is born, and what will she do with it? Can she carry back to her home the living proof of her shame? She cannot think of it. Where is then the refuge for the fruit of her unhappy love? A voice, which breaks her heart, answers—the foundling hospital awaits it.

A woman having been confined recently, is in what physicians call the *puerperal state*. During this period of time she is extremely accessible to morbid agents. This is a well established fact; all physicians agree on this point. If we consult the best authorities, we shall satisfy ourselves that the affections of the mind have an extraordinary power to increase this aptitude to sickness, and among the various diseases which they provoke, are peritonitis and uterine phlebitis, two formidable and often invincible enemies. We found that point of doctrine so frequently confirmed by reality, in the hospitals of Paris, that to us, it was from that time demonstrated beyond doubt. Whenever a pregnant woman entered in the service where we were, we used to ask her the following three questions: How long have you been in Paris? Are you married? Is it your first child? If she answered—I came into Paris four months ago; I am not married; it is my first child—woe to her! we knew she was almost doomed to an inevitable death. We had seen so many pass one after another from the beds in the wards to the iron tables of the dissecting room. Every body knows the famous ballad of the great poet of France, beginning thus:

"How many young girls have I seen die!"

We recollect now, that we sometimes used to say to ourselves in those hospitals: Here is the stern kingdom of reality, and how much more it becomes us to speak these melancholy words—How many young girls have we seen die!

Among so many, we remember one especially, who had come to Paris with a deep conviction that she never would retrace her steps to her native place. We tried our best to soothe her, but in vain; she had a presentiment that her confinement would prove to her a sentence of death, and rejected all consolation as useless. She was delivered successfully, and every thing went on in such a satisfactory manner during two days, that some persons would jest at her for her former fears. But after that time she began to present some alarming symptoms; they grew worse and worse, and it was not long before it became manifest that she was lost beyond doubt. Her head was free to the last; she saw at once all the danger, and yet she had such a desire to recover for the sake of her new-born child, that she struggled against death with an extraordinary strength of mind. It was an awful sight even for those who had long been accustomed to scenes of this description. There was something both sublime and thrilling in that woman sitting up in her bed, with her features already distorted by the convulsions of impending death, and collecting all her energies with the idea that by gaining time she might wear out her disease. Her last thought was for her infant. Now he is going to be without his mother, sighed she; what will become of him! With these bitter words she breathed her last.

The father of medicine, the immortal Hippocrates, knew so well the influence of the mind on the body, that he professed the physician to be wanting in common ability who did not possess the art of comforting his patients. Man has not changed; he likes now as he did in former times, to see in the physician standing by his bedside, not only a scientific personage scrutinizing the causes of his disease, but as a friend too, who sympathizes with his sufferings, and whose presence is the sweet harbinger of returning health. The physician must have a profound knowledge of the human heart; he must be acquainted with those numberless sorrows which secretly embitter the heart and poison the sources of life. He should be the priest of the mind to be the restorer of the body. At the same time that he calls to action the benificent virtues of remedies, let the language of hope flow from his lips, and consolation beam in his smile. The patient thus attended, will bear his pains more lightly, and nature seconded by art, will be more at ease to accomplish the mysterious work of cure.

ART. IV.—*Medical Matters at Paris.* (Extract from a letter from W. A. McPheeters, M. D., to S. A. Cartwright, M. D.)

63 Rue de Seine, Paris.

DR. S. A. CARTWRIGHT:—*My dear Sir:*—I derived great pleasure from the perusal of your very interesting letter, which came to hand a short time since. I thank you for the many useful hints which it contained, and I will take pleasure in profiting by them while pursuing my medical studies.

You ask how the French treat purulent ophthalmia? I attended the clinic on diseases of the eyes of M. Desmarres for two months, and saw a number of children affected with that disease. In all genuine cases of purulent ophthalmia, he always resorted immediately to the cauterizations with nitrate of silver. He everted the upper eyelid and cauterized it thoroughly with the solid stick, and then washed it with a solution of chloride of sodium to destroy the excess of the cautery, and to prevent it from coming in contact with the cornea. He said, however, this means must be employed with great care, as very sad consequences might result from its untimely and injudicious employment. He also directed the eyes to be kept as clean as possible, and cold cataplasms to be applied over the lids. In cases of *catarrhal* ophthalmia, where often the lids are very much swollen, and there is an abundant mucous discharge, bearing a close resemblance to the purulent variety, the two diseases might easily be confounded. In these cases, M. Desmarres pursues a much milder course of treatment, viz.: by a pommade of cupri sulph. introduced between the eyelids; by purgatives, footbaths with salt and ashes, bathing the eyes every hour or two with a collyrium of ratanhia or some other vegetable astringent. He cautioned us very particularly about using the argenti nitras in these cases, and said that a great many eyes had been destroyed by its improper use in such cases. But in the true purulent ophthalmia, he relies almost wholly on its efficacy, especially at the *début* of the malady, and when there is no trace of softening of the cornea.

Desmarres, in his treatise on this subject, after speaking of the efficacy of cauterization says: "je n'ai aucune sorte de confiance dans le traitement par les antiphlogistiques, les lotions émollientes, et les préparations mercurielles vantées par beaucoup de praticiens dans la première période de la maladie. Les collyres doux, loués par la plupart des auteurs, ne réussissent qu'au début ou dans les seuls cas où une conjonctivite catarrhale simple a été prise pour la conjonctivite purulente."

M. Desmarres, formerly the pupil of Sichel, now his rival, has a very large *clinique*, and takes great pains to instruct his pupils. He is very skilful in the use of the ophthalmoscope, by which he diagnosis all maladies of the interior membranes of the eye with great accuracy. The ophthalmoscope is a small instrument which reflects a strong light into the interior of the eye, which enables us by the aid of a bi-convex glass, to see the interior of the eye through the pupil. This discovery bids fair to be of as great service in the diagnosis of diseases of the eye, as auscultation has been in diseases of the chest, but, like auscultation, it would require a great deal of practice in its use to be able to diagnose with any degree of accuracy.

During the past winter, I have paid particular attention to the study of auscultation and percussion, and will continue to do so as long as I have the opportunity, as one cannot know that important part of the science of diagnosis too well.

I think that Paris is a much better place to learn diagnosis than the treatment of disease, although one has the opportunity of seeing various modes of treating the same disease by different eminent physicians.

I followed the wards of M. Bouillaud for some time, to observe the effects of his "*sine quâ non*," the lancet. In all phlegmasias he depends almost entirely on bloodletting. In one case of pneumonia he had the patient bled *seven* times in five or six days, taking each time from twelve to sixteen ounces of blood by venesection and cups. The disease was finally arrested by this heroic treatment, and the patient slowly convalesced from his exhausted condition. He took no antimony or mercury, and in fact, no medicine until the inflammation was checked, after which, it was necessary to give him tonics to resuscitate him from his exhausted condition, produced, not by the disease, but by the treatment. More than a month elapsed before this patient was able to leave the hospital.

In another case of pneumonia, that of an old woman, more than sixty years of age, five bleedings were ordered in the space of three days, at the end of which time the inflammation subsided, and strange to say, the patient recovered, or at least regained sufficient strength to leave the hospital after a considerable lapse of time. In rheumatism, the same course is pursued, but this powerful antiphlogistic does not prevent the frequent occurrence of endocarditis and pericarditis during the march of the rheumatism. As we cannot follow the cases after they leave the hospital, we are not able to know how many of these patients die of phthisis or other diseases to which they may be predisposed, and which their exhausted condition would call into action. M. Bouillaud pretends that his statistics show a much smaller degree of mortality than those of any other physician who has pursued a different course of treatment, but I do not believe it. I forgot to mention that in connection with bloodletting, he uses blisters, which is the only adjuvant employed to check the inflammation.

M. Piorry, the great *percussor*, has his hobbies also. He says that quinine will reduce the size of the spleen instantaneously in cases of intermittent fever. He pretends to mark out the exact size of that organ to the eighth of an inch, by percussion, and thus judges of the difference before and after the administration of the remedy. I saw another physician making similar experiments, by giving the patient simple water, and he found an equal diminution of the spleen, by percussing both before and after the potion was administered.

M. Piorry treats phthisis by means of inhalations of the vapor of iodine. I noticed the frequent occurrence of hæmorrhage with patients under this treatment, which I thought might be due to the irritating properties of this medication. He arrests the hæmorrhage by means of perchloride of iron, given in doses of ten or twelve drops in a potion. He also recommends this remedy in cases of hæmorrhage from the bowels, giving an injection containing about a drachm of the tincture (40°) to four ounces of water.

The subnitrate of bismuth is extensively used here in diarrhœa. They give it in enormous doses, even to young children, from one to two drachms during twenty-four hours. It seems that this medicine may be given in almost any dose, when perfectly pure, but if it should contain impurities, as sometimes is the case, it may produce exactly the contrary effects, and increase instead of abating the disease.

In pseudo-membranous croup, physicians give chlorate of potassa, which seems to have a good effect in preventing the formation of false membrane, and in detaching it from the larynx and trachea, after it has formed.

I am now attending the Hospital *des Enfants malades*, and have seen four cases of this disease treated by this remedy. The result was not very satisfactory, as tracheotomy had to be performed in all four cases, on the second or third day of the disease, and two of them died from *complications* of pneumonia and bronchitis. The other two are doing well, though the air still passes through the opening in the trachea. It is hoped, however, that the wounds will be entirely closed in the course of a few days more. In these cases, the chlorate of potassa may have prevented the false membrane from extending down into the trachea, though it could not prevent the supervention of pneumonia which caused the death of two of the little patients. In conjunction with the potassa, they give emetics, cauterize the fauces with nitrate of silver, etc.

Numerous experiments have recently been made in Paris with a new anæsthetic agent, amylene, which was first used by Dr. Snow, of London. It is less powerful than chloroform or ether, and was supposed to be entirely free from danger. However, one death has recently been caused by it in Dr. Snow's practice, which sad occurrence has somewhat abated the ardor of its supporters. It has a disagreeable odor, is more expensive, and less efficacious than chloroform ; hence, I do not think it will supersede the latter. Chloroform is used very extensively in Paris, but I have not seen or heard of a single death from its use since my arrival nine months ago, which shows how rarely accidents happen from its use. I have seen M. Brichet administer chloroform in several cases of hysterical attacks. The patients were very soon quieted down into a quiet slumber, from which they awoke entirely relieved.

M. Trousseau has commenced his spring course of clinical lectures at *Hôtel Dieu*. He is a fine orator and a very interesting lecturer, but his views cannot always be relied upon ; at least, they often differ from those generally adopted by the profession. As a clinical lecturer, M. Nélaton surpasses any one I ever heard. His remarks are concise and always to the point. His great forte seems to be in making correct diagnoses, though he is also a very skilful operator. His lecture room is always crowded with students, while M. Velpeau often has a thin attendance, which shows at least that Nélaton is the most popular lecturer.

The mortality of patients operated upon in Paris is very great. At first I was inclined to attribute it to the enfeebled condition of hospital patients; but M. Nélaton, in a lecture on the subject, said that equally fatal results occurred in private practice. He attributes this great mortality to some peculiarity in the atmosphere of Paris, which produces purulent absorption. He says that in the provinces of France, similar operations are performed with much better success. In the Parisian hospitals, it is the exception rather than the rule, for a patient to recover after an amputation of the leg. The absorption of pus is the usual cause of death. I would never advise any one to come to Paris to be operated upon, although the surgeons are very skilful.

I have, doubtlessly, already wearied you by this long letter, so I will not extend its limits further. Yours most truly,

May 6th, 1857. W. A. McPHEETERS.

ART. V.—*Non-Fatal Cases of Cholera.* By BENNET DOWLER, M. D. Continued from Vol. XIII p. 640.

To practise, to record cases, and to make post mortem examinations in cholera during an epidemic, require an amount of individual labor, mental and corporeal, which few will be willing to assume. Hence, in the numerous works on cholera, it will be found that the history of its progress, including its mortality statistics and reflections on its cause and cure, preponderate over the histories of individual cases written at the bed-side, and in the dead-house.

In the present article, it is proposed to copy a number of cases from original notes made simultaneously with the occurence of the events to which they refer, without comment and without adopting the principle of selection. The ordinary, not the extraordinary cases, will, therefore, be given on this occasion, excluding for the present, therapeutical, pathological and anatomical data and discussion.

1848. December 21st; 8, P. M. J. H., aged about twenty-five, married, resident seven years, laborer; worked at loading a ship until noon; has had a copious, watery purging for 24 hours. In the evening he became weak, faint, hands wrinkled; rapid purging; vomiting; cramps in the arms, fingers, legs, and had one paroxysm of general spasm or convulsion. Had, before I saw him, used baths of mustard to his legs; sinap. over the stomach, and general frictions. Found him cramped, vomiting, etc. Pulse small, thready, variable, irregular; respiration quick; feels a want of breath, or a sensation like smothering; eyes injected; slight head-ache; great thirst; skin congested, of a dull red; nails darkish; repeat the mustard; table spoonful of cold water often repeated; R. Cal., mass. hydr., quin. sulph. ℈i*aa*; morph. sulph. gr. v, in twelve pills; two every hour.

December 22d; 8, A. M. Has taken the twelve pills; soon after the first dose, cramps and vomiting ceased; has had but two thin stools; intense thirst; pulse small, thready, intermittent, 100; skin not hot; respiration, tongue, etc., little changed; nails darkish; small potions of iced lemonade; to be followed by chicken-water.

Noon. Has had a sleep, the first since he was taken sick; has a natural sweat; moderate vomiting; lemonade grateful; pulse small, variable, intermittent; urinated once only since his attack.

6, P. M. Pulse small, 100; much thirst; no urine.

December 23d; 8, A. M. Nausea; no urination or defecation for more than twenty-four hours; weak voice; small, feeble pulse, but it is a little fuller; skin warm; thirst; thinks his gums are tender; Rhei, aloes, *aa*ʒi. in twenty-pills; five every two hours until purged.

Noon. Costive; has taken ten pills, without effect; directed an enema; fomentations of the lower abdomen; no urine.

6, P. M. No urine; introduced catheter, neck of the bladder resisting; drew off about 1 ℔ of turbid urine; no stools; enema and fifteen pills retained; vomits moderately; tongue furred, being a little brown; continue enemata, with three tablespoonfulls of salt in each; skin moist all day.

24th. Had copious fæcal and urinary discharges; is convalescent; no mercurialization; at night tenesmus come on.

25th. Costive; took an enema; had a bloody stool in the dysenteric straining; tongue, pulse and breathing nearly natural; takes quinine and morphia; sinap. to the abdomen.

26th. Convalescent.

At 9, A. M., saw this man's eldest child, who had been taken at midnight with cholera; it was dying when visited. It lived until 11, A. M.

At 4, P. M., the other and only remaining child was found dying; no prescription was thought expedient. The quantity of rice-water or milky stools was very great; one stool which I saw was little short of two pounds.

1848. December 29th. F. Y., aged thirty-six, late of the American Army of Mexico; has had vomiting and choleraïc purgings for two days, during which time he has been using warm foot baths; also, sundry doses of blue mass, prepared chalk, and the sulphate of morphia.

December 30th. Vomiting and purging continue; cramps; skin cool; pulse small; intense thirst; has taken to-day at intervals, a pill of opium, one grain; repeated this dose until four pills had been taken; removed to the hospital.

31st; M. Senses regular; skin pale; tongue tumid, rough and dry; respiration easy; heat indifferent regions from 88° to 96°; vomiting and purging; cramps slight; thirst; supposed to be convalescent.

This patient in thirty-six hours before entering the hospital, took five grs. of sulph. morphia, four grs. of solid opium, sixty grs. of blue mass and ninety grs. of prepared chalk.

1848. December 26th; 5, P. M. C., a German laborer, aged about twenty-five, having eaten dinner as usual, worked during the afternoon until taken sick with purging, vomiting and cramps; whereupon he returned home, took a teaspoonful of the tincture of camphor and some brandy. I saw him an hour after his return, and found him suffering from severe clonic spasms of a tetanic character, which included, at times, opisthotonos; stertor, paroxysms of asphyxia amounting almost to apnœa; four men were scarce able to hold him during the convulsive paroxysms; in the intervals he is usually insensible, but had several gleams of sense; said he had pain in the head and belly. Cups to the nape and epigastrium; blue mass ℈i; cretæ ℈iss, in two doses; sinapisms; cold to the head. In an hour the clonic spasms ceased; the pulse was variable but not small; he had now red flushing of the face. (Here is an apparent combination of cholera and cerebral congestion.)

At 8, P. M., neither vomiting nor purging; cramps in the arms, but most of all in the abdominal muscles which swell up in rigid masses, like vast bony tumors. The abdomen is distended; its cavity or the bowels contain a fluid as indicated by fluctuation upon percussion.

December 27th. Fever. Mass. Hydr. et cretæ. On the next day this patient was convalescent.

1848. December 26th; 8, A. M. An Irish girl, a washer-woman; had suffered from diarrhœa for two days, from vomiting, choleraïc purging, and cramps for twenty hours; has a weak voice; a bluish, corrugated, cool skin; pulse irregular and small; respiration quick; tongue pale, moist; thirst; restlessness; debility. Directed external warmth; foot-bath; sinapisms; also doses of opium and quinia.

Evening. Vomiting, purging, and cramps continue. Opium and quinia.

27th. Vomiting and purging slight.

28th. No change. Opium; chicken-water.

29th. Convalescent.

1848. December 24th; 8, A. M. Mr. C., resident eleven years, aged about forty; has had vomiting with choleraïc diarrhœa for fifteen hours; pulse quick and feeble; skin wrinkled; tongue natural; intense thirst; directed mercurials, opiates, quinine, sinapisms.

25th. Choleraïc stools. Quinine; morphia.

26th. Bowels quiet. Nausea. Pulse soft; skin natural.

27th. Choleraïc stools. Quin. and morph.

28th. Convalescent.

1849. November 19th; Morning. Called to see an Irishman; laborer; resident three months; aged about twenty-five; he has had diarrhœa for a week; voice feeble, husky; face and hands bluish, dark; the eyes, surrounded with dark areolæ, are sunken and injected; tongue cool; skin much shrivelled, and cold; pulse thready, variable, often imperceptible; thirst; cramps in all the limbs; copious stools like starch-water; much vomiting; mind clear. Directed sinapisms in succession over the skin generally; camphor; quin.; morph.; caps. in pulv.

Evening. After many vomitings, threw up a mass of potatoes unchanged, eaten the day before; cramps and purgings diminished, otherwise worse; skin cooler; pulse less distinct.

20th; Morning. Copious milky purging last night, also vomitings; pulse more distinct; skin less cold and less shrivelled. Cal., quin., camph., opium; chicken-water.

Evening. Pulse a mere thread, sometimes irregular, and then imperceptible; respiration slow; skin cool and clammy; tongue dry; no urine since last night; purging arrested; vomits still without a tinge of bile, a sour water; face reddish slightly; thirst diminishing; no pain; sleeps some; has taken about fifteen grs. of cal. one and a half grs. opium, ten grs. quin., ten grs. camph., to-day, with chicken-water; senses natural.

20th. Convalescent; next day this man was sent to the hospital. On the 25th he had diarrhœa. On the 27th he was reported convalescent again.

1849. April 3d. Mr. C., aged fifty-five, resident in New Orleans twenty years, in easy circumstances, leading an active life. He attended to business as usual during the day, although he stated that he had had about a dozen of copious watery stools.

At night cramps came on, and he sent for medical aid, having taken, in the meantime, brandy and laudanum.

Present state: loss of voice, pulse variable, quick, thready, intermitting, and sometimes nearly imperceptible; purging, vomiting and cramps continue.

Extensive sinapisms; pulv. opiat.; pills of quin., cal. and blue mass.

4th; 7, A. M. Pulse fuller, but very unsteady; vomits; no purgations; skin moderately warm; aphonic; rests; chicken-water; claret; ice.

1, P. M. Vomits; two defecations, about three pints, milky, yet rather transparent and inodorous; pulse variable. Pulv. opiat., with chalk, to be followed with small doses of cal.; ice; sinap. extensively over the whole body in succession.

6, P. M. The purging seems to have been arrested by the pulv. opiat., sinap., cal., etc.; no cramps; no urine since yesterday; pulse variable; skin dry and warm.

5th; 8, A. M. Is improving; pulse fuller, more regular; no urine since the attack.

3, P. M. Improves; no urine; catheter introduced with some difficulty—about six oz. urine drawn off. Sinapized surfaces getting very red, and painful.

8, P. M. Pulse firm; skin dry; two small muco-bilious, greenish, fœted stools, in all two or three oz.; a table spoonful of urine; vomits occasionally.

He ate milk, bread, coffee, etc., this morning, which gave him nausea, heart-burn, etc. Restricted to chicken-water, ice, teas, gruel.

6th; 9, A. M. Pulse full; skin dry; voice returned; slept well last night; no stool; has discharged but a spoonful of urine since 8, P. M., yesterday; since the commencement of the attack, three days ago, has had only about seven ounces of urine; tongue a little tumid and furred. Cal. gr. xii; chicken-water.

3, P. M. Scarcely any urine; costive; ol. ricini was given freely, which failed to operate in three hours; enemata were given, which carried off black, heavy, sedimentary or mud-like stools.

8th. Stools yellowish; urine natural; skin dry; pulse full; tongue cleaning at the tip, being yellow and dark at the base. Well, nearly.

In this severe case of cholera, the treatment apparently saved the patient's life. His wife had just died of cholera. He viewed his own case despondingly.

The mustard plasters which were applied over a great part of the body, though painful at the time, produced no redness or apparent hyperæmia of the skin, until after the subsidence of the choleraïc symptoms, when a severe redness, swelling and pain occurred, which lasted about a week, without, however, producing ulceration.

1849. From March 11th to the 22d, I treated with success five of the crew of the ship Duke, for cholera. These cases assumed, to an unusual degree, febrile symptoms; the choleraïc symptoms, though well marked, were blended with fever.

In one case, that of a man aged about eighteen, the cholera appeared to have reached the stage of collapse. This youth had severe vomitings, purgings, cramps, coldness, wrinkling of the skin, loss of voice, small, irregular, and often imperceptible pulse, intense thirst. The stools were like milk and water, with coagulated streaks and fragments, being inodorous. He was treated with opiates by enemata and by the mouth, with calomel, blue mass, quinine and external stimulating applications; foot baths, sinapisms, frictions. After the disease was checked somewhat, the milky stools continued; when they became a little fœted, they were still thin like water, and sometimes brownish; finally, a little feculent matter in minute points appeared; for nearly a week his recovery seemed doubtful, though he had but little fever following the cholera; his eyes were red with injection, and were dull, heavy and rolled upwards; his tongue tumid, edges and tip red; thirst; sleeplessness; sad and despairing; his pulse became full, soft, gaseous; the treatment, except quinine and an occasional opiate a few times, was suspended as soon as the choleraïc stools were arrested.

1850. November 9th. A gentleman who had taken no supper, as was usual with him, was attacked with cholera in the night; had had but two evacuations during the day; he had felt cold or chilly. At midnight four or five choleraïc evacuations occurred at short intervals, varying from five to ten minutes, attended with chiliness. Suddenly the nostrils became stuffed or obstructed and dry, so that the breathing was carried on only through the mouth. The salivary secretion was arrested at the same time. Nausea, vomiting and prostration followed. Directed quinia, ten to fifteen grs., morphia, from one to two grs., and a portion of brandy. This dose, though retained nearly an hour, was partly, perhaps mostly, vomited. It appeared to produce no stimulating effect, nor was there marked narcotism. The purging, however, was checked. The bowels were still distended with liquid, and there was an inclination to evacuate them; but this liquid, which evidently fluctuated in the bowels, was reäbsorbed. No alvine evacuation took place for two days. No other remedies were used, except hot foot baths and sinapisms.

1848. December 29th. A young man, whose sister is convalescing from a severe attack of cholera, was attacked in the night with vomiting and copious choleraïc purging. One grain of solid opium was given and retained. The stools were speedily checked. He took no other remedy, and recovered his usual health in a day or two.

In these two last mentioned cases the treatment began as soon as the disease was suspected to be cholera, the full development of which was anticipated, not waited for. Analogy, observation and experience show that such cases are incipient cases of cholera, which are often easily arrested, if not neglected; but if neglected, they usually proceed to a fatal termination, particularly if an epidemic exists at the time. Cholera is not the less real because it is in its primordial stage. It is as real as is a conflagration in its incipient and extinguishable condition.

My experience has furnished more than one case in accordance with the following summary: It is midnight; you are called to see a stout man who, after several choleraïc discharges, is agonizing from spasms which extend to almost every muscle of the body; friends are rubbing down the muscular knots. The apothecary may be distant and asleep withal. Delay is dangerous. There is laudanum or paragoric, and whiskey or brandy in the house. Mix, make an injection, and throw it up the rectum. I have found, sometimes during the cramps, that the sphintcer ani was spasmodically contracted, so as to make it difficult to introduce the nozzle of the syringe. If the medicine be retained, as it will sometimes be, in an hour, or even in half an hour, cramps and danger will have passed away, in some instances, at least.

A middle-aged gentleman, long resident in New Orleans, who had suffered an attack of cholera in 1833, was attacked a second time, May 28, 1849. The only premonitory symptoms he experienced previous to the attack were exhaustion, drowsiness, a burning in the soles of the feet, and yawning, which, for several days recurred about noon: but there had been no diarrhœa. At $2\frac{1}{2}$, A. M., a semi-fluid evacuation occurred, and in about twenty minutes after, watery purgings and vomitings, accompanied with chills, began soon after; cramps in the legs became severe; the stools were like rice-water; no bile was vomited, with a slight exception. Hiccups took place frequently and severely, chiefly after the paroxysmal cramps in the legs subsided; the pulse varied, was rapid and small; the breathing slight, accompanied with a smothering sensation; vomiting always gave temporary relief to the pulse, breathing and nausea. After vomiting, a pill of eight or ten grs. of blue mass was taken for three times; these were usually rejected, though in a broken or dissolved state; half a grain of the sulphate of morphia and two grains of sulph. of quin. were taken without any apparent anodyne effect; mustard and external heat were extensively applied.

At about 8, A. M., a copious draught of mustard and water was taken, which acted promptly, vomiting several times, bringing away much liquid and some mucosity; then gave cal., quin., camphor, pulv. caps., each five grs.; the dose was soon repeated; after which two or three vomitings took place, but the purging was checked. In two hours several doses of tinct. valerian, red pepper and catechu were given. One attack of cramps followed. In the meantime extensive frictions over the body were made with a liniment of vol. alcali and red pepper. This produced an immediate glow or burning on the skin; this burning returned in paroxysms for twenty-four hours.

Thirst was developed strongly in a few minutes after the first liquid stool. This was partially quenched with small portions of ice-water. The vomitings were inodorous and tasteless, (the medicine excepted,) and were easy. The urinary and salivary secretions were suppressed for about ten hours.

Soon after the last stool a considerable quantity of watery liquid was accumulated in the bowels, as was evident to the touch and feelings of the patient; this was retained, and must have been absorbed, as during the following day, there was but one evacuation, which was nearly as black as charcoal, and was of the consistence of molasses, and did not exceed a quarter of a pound.

A slight salivation, or rather a swelling of the salivary glands and gums followed.

The third day a small, dark, semi-fluid stool took place.

In this case the medication began with the disease.

1849. November 18th. Was called in the night to see a female slave of Mr. ——. This woman, aged about thirty, has at the breast a child; she was two months old. Cramps, vomitings, rice-water stools, passing the latter in bed; aphonic; shriveled, cool skin; pulse small, irregular, intermittent; imperfect respirations; thirst. After many vomitings and purgings, she threw up bread, etc., which had been eaten during the day, still totally unchanged in appearance. Pulv. opiat.: sinapisms in great number.

19th; Morning. Vomitings continue; cramps, purging diminished. Sinap., quin., morphia.

Evening. Purging and cramps checked; vomits much; no urine since yesterday. Chicken-water.

20th. Sleeps; convalescent.

The milk was secreted in her breasts during her disease, causing hardness and tumefaction. Is not milk secreted in cholera? I have observed that this is sometimes the case in both fatal and convalescent cases; also in the dead. This is remarkable, for the secretion of saliva, bile, urine, etc., are arrested in this disease.

25th. Well. No alvine evacuation for five days.

(To be continued.)

PROGRESS OF MEDICINE.

Art. I.—*On the Physiological Mechanism of the formation of Sugar in the Liver:* by M. Claude Bernard. (Academy of Sciences, sitting of March 23, 1857.) Translated from the *Gazette Hebdomadaire de Médecine et de Chirurgie* of April 3, 1857: by M. Morton Dowler, M. D., New Orleans.

In a communication addressed to the Academy, September 24, 1855, M. Claude Bernard pointed out the results which had brought him to conclude, contradictorily to the views which he had previously entertained, that sugar is not *formed* at the very onset in the hepatic tissue by the direct abstraction of any particular element directly from the blood, but that, on the contrary, the production of the hepatic sugar is constantly preceded by the creation of a special matter, capable of giving immediate birth to sugar, by a kind of secondary fermentation.

The object of the present communication (March 23, 1857,) is to announce the positive and isolable existence of the glycogene matter which is immediately preëxistent to the formation of sugar.

It was evident, said M. Bernard, from the facts contained in the communication of 1855, that the glycogene matter created by the liver in the physiological state during life, is susceptible of being changed into sugar, simply through the agency of a ferment, and independently of the vital influence. The experiment of the washed liver, which became, notwithstanding, newly charged with sugared matter, afforded the proof.

The whole difficulty then, consisted in the separation of the matter in question from the tissue of the liver, and its isolation from its ferment with which it is associated.

From seeing that the process of boiling arrested the further formation of sugar in washed liver, I was for a very long time impressed with the false idea that the glycogene matter must be an albuminoid substance, changeable by heat; whilst in reality, it was but the ferment alone which was destroyed by coction; and of this I ultimately assured myself, by reproducing the fermentation in the washed and boiled liver, through the agency of the ferment borrowed from fresh hepatic tissue.

And thenceforth it was evident to me, that the hepatic glycogene matter possesed the property of dissolving in boiling water, and that it could thus be separated from its ferment, which remained coagulated with the other albuminoids of the liver.

The experiments reported in this memoir, have for their object to prove, that the liver of dogs fed exclusively on flesh, possesses specially, and excluding every other organ of the body, the property of creating a glycogene matter altogether analogous to vegetable starch, and, like it, capable of ultimately being transformed into sugar by passing through an intermediate state, namely, that of dextrine.

In regard to the physiological formation of sugar in animals, it must be necessarily considered, not as a direct chemical contribution from the materials of the blood, at the moment of the entrance of that fluid into the liver, but its production must be regarded as the result of a function constituted by the succession and union of two acts which are essentially distinct.

The first act, which is wholly vital,—so called because it cannot take place without the direct influence of life—consists in the creation of the glycogene matter in the living hepatic tissue.

The second act, which is entirely chemical, and which can be accomplished independently of the vital influence, consists in the transformation of the glycogene matter into sugar, through the agency of a ferment.

In order therefore to the appearance of sugar in the liver, there must be a union of conditions admitting of the occurrence of these two acts. It is essential that the glycogene matter should be created by the vital action of the organ, and it is essential, afterwards, that this matter should be brought into contact with its ferment, by which it is to be transformed into sugar.

The glycogene matter is formed, as are all the products of organic creation, as a result of the phenomena of the slow circulation, which immediately ministers to the process of nutrition. Let us see how the contact of the glycogene matter with its ferment operates in the living animal.

I had at first thought that the ferment was special to the liver, as the glycogene matter itself, and I had even succeeded in isolating it. But seeing again that the liquor sanguinis possesses the property of transforming with great energy, this glycogene matter into sugar, it became impossible to entertain the idea of the localization of the ferment, which, coming probably from the blood itself, can be extracted from the liver. So that, if without the organism we have numerous ferments capable of transforming glycogene matter into sugar, in animals, it suffices to admit the existence of a ferment in the blood possessing also the property of rapidly changing hydrated vegetable starch into dextrine and then into sugar. The observation of physiological phenomena teaches, that in the liver, concurrent with this slow nutritive circulation, there exists another intermittent, variable circulation, the super-activity of which coincides with the appearance of an increased quantity of sugar in the hepatic tissue.

In animals during digestion, the circulation in the vena porta is super-excited, and the transformation of the glycogene matter is much more active; though the formation of this matter does not appear to correspond with this period. This super-activity of the circulation in the vena porta, can be aroused in the absence of digestion, and the same phenomenon of transformation of the glycogene matter, and the appearance of sugar, can be equally made to take place. In hibernating or torpid animals, as frogs, for example, the sluggishness of the circulation which is connected with lowness of temperature, tends to a diminution, and sometimes to a very nearly complete disappearance of the sugar in the liver; but the glycogene matter is always present, as can be proven by our being able to extract it. It is only necessary to put the torpid frogs under the influences of heat, and thus to render their circulation active, in order to see the sugar appear in their livers. By placing the animals anew in a low temperature, we shall find the sugar diminish or disappear, to again show itself when the frogs are again placed in a more elevated temperature.

In warm blooded animals we can also operate through the medium of the nervous system, on the phenomena of the abdominal circulation, and then, secondarily, on the transformation of the glycogene matter in the liver. I have shown that when the spinal marrow is cut or wounded in the region of the neck, below the origin of the phrenic nerves, the hepatic circulation is considerably diminished; so that, at the expiration of four or five hours, there are no longer any traces of sugar in the liver of the animal, the tissue of the organ at the same time, nevertheless, remaining charged with glycogene matter.

I have likewise proven, that by wounding the cerebro-spinal axis in the region of the fourth ventricle, we produce exactly opposite phenomena, the abdominal circulation being thereby highly accelerated, and, consequently, there is an augmentation of contacts of the glycogene matter with its ferment. The transformation also of the glycogene matter becomes so active, and the quantity of sugar carried into the blood so considerable, that the animal, as is known, becomes a diabetic, that is to say, the excess of sugar thrown into the blood by the super-excited liver, passes into the urine.

In these two several conditions, the nervous system evidently acts on the purely chemical manifestation of a physiological phenomenon. But when we analyze the mode of action, we realize that the effects have been only mechanical, primitively manifesting themselves on the motor organs of the capillary circulation, which has had the effect, in the one case, of lessening or preventing, and in the other, of increasing and augmenting the contacts of two substances capable, from their properties, of acting on one another, thus giving birth to a chemical phenomenon which the nervous system indirectly rules, but on which it has no direct or primitive action.

As to the conclusions that we may actually deduce in a general physiological point of view, in regard to the mechanism that we have indicated in the formation of sugar in the liver, it is impossible that we should fail to be struck with the similarity which exists in this respect, between the glycogenic function of the liver, and the production of sugar in certain acts of the vegetable organism.

The formation of sugar in the liver, is effected through a series of distinct transformations, altogether analogous to the successive production of starch, dextrine and sugar, in the seeds of vegetables.

ART. II.—*Amylenic Anæsthesia:* by DR. DEBOUT. Translated from *L'Union Médicale:* by M. MORTON DOWLER, M. D., of New Orleans. (Continued from the May No. of this Journal.)

CASE I.—*Ablation of the Matrix of the nail of the middle finger of the right hand; Cauterization with the red-hot iron; Anæsthesia obtained in four minutes.*—Désiré Debènne, locksmith, entered the hospital of Beaujon on the 3d day of March, 1857; temperament dry and nervous; attacked six weeks previously with a whitlow, the cause of which he could not explain—perhaps it originated from a pinching of his finger, a kind of accident common enough in the trade he follows—came for advice three weeeks since. The nail was detached, with the exception of the portion comprised in the matrix. At this period there was developed at the dorsal extremity of the finger, a bleeding and fungous ulcer, the seat of slight pain, not having any tendency to cicatrization. The following is the present condition : The extremity of the finger in the whole extent, corresponding to the last phalanx, is enlarged, so that the entire finger resembles a spatula in shape. In the situation of the nail there exists an ulceration of an elliptical form, the granulated fungous surface bleeding with the slightest contact. The margin of this ulceration is tumid and of a livid red, especially at the root of the nail. On raising the posterior border of the ulcer, the base of the nail was seen occupying the whole of the ungual matrix. M. Robert determined to remove the affected parts, and to cauterize with a red-hot iron all the ulcerated surfaces. This little operation being necessarily very painful, the patient was anæstheticized. M. Debout employed the amylene prepared by M. Berthé. The patient being placed in the horizontal position, the apparatus of Charrière was applied, so as to include the mouth and nose, in which had been poured fifteen grammes of amylene, and the patient was instructed to inhale largely. After a few inspirations, the face appeared a little congested, there was a marked acceleration of the pulse and the pupils were slightly dilated. The patient did not speak, and did not evince any disagreeable sensation. The apparatus was a second time charged and with nearly the same quantity, and insensibility speedily supervened, without agitation or muscular contractions—in the quietest possible manner. The quantity of amylene employed may be stated at thirty grammes, and the time required to produce anæsthesia was four minutes.

M. Robert proceeded then to the operation. An antero-posterior incision of half a centimètre was made with scissors, in order to facilitate the excision of the matrix of the nail. The nail was torn out by the fingers of the surgeon, and afterwards two red-hot irons were applied in succession to the bleeding surface. During the operation, which was not of long duration, the patient continued to respire the vapor of amylene, and did not, by either complaint or movements, give evidence of pain. The apparatus being withdrawn, the patient resumed consciousness, and stated that last year he had been anæstheticized by chloroform at the Hospital St. Louis, during an operation performed on the left index finger, which had been crushed by machinery, and that the result had been general illness and cephalalgia for the space of three days.

A few minutes after the operation, Debènne had disagreeable feelings, and exhibited muscular contractions; no nausea, pulse 120. He attributed all uneasines to want of fresh air, and indeed, the apartment in which the operation was performed, was rather contracted and full of the vapor. His disagreeable feelings disappeared in a short time, on opening the window.

Two hours after we saw this patient, who had long before recovered from his disagreeable sensations. He was free from headache, and took soup. We questioned him relative to the sensations he experienced during the inhalation. The patient, who appeared to be very intelligent, replied by comparing his present experience with that of last year, when he underwent chloroformization. According to him, the vapor of amylene is not disagreeable, and does not occasion that prickling of the throat and secretion of saliva which attends chloroform. The dream is one of greater gaity. He thought he was present at a wedding, and went thither on the American railroad. His impression was, that he had spoken during his whole sleep, though in fact he had not uttered a word. He had heard a part of the conversation which had taken place during the operation, and recalled perfectly what M. Debout had said to M. Robert, when it was remarked that at times the patient had his eyes open. The sleep came on abruptly. The patient said the sleep had been much more tranquil, and had been attended with much less anxiety than when he had been somnolescent from chloroform, but that the anæsthesia had been less complete. Each time that M. Robert touched his finger with the cautery, he did not indeed feel pain, but very disagreeable agitation. The absence of cephalalgia, and the persistence of appetite, appeared to him the principal reasons for preferring the new agent.

CASE II.—*Disarticulation of the last phalanx of the index finger; Resection of the extremity of the second phalanx; Anæsthesia by amylene in two minutes.*—A man, *æt.* 65, strong and vigorous, in consequence of a puncture on the palmar surface of the finger by the fin of a fish, was affected with whitlow. The inflammation occupied the integuments, the tendinous sheath of the flexor, and even the articular surfaces, which are movable and give out a crepitating sound when moved. M. Robert, after having cut an oval flap, disarticulated the last phalanx, and finding the head of the second bone unsound, it was then resected.

For this operation, M. Debout put the patient under the influence of amylene. Anæsthesia was obtained in two minutes, and was continued to the end of the operation. During the whole time the patient was plunged in a profound sleep, which supervened without shaking or agitation. As soon as the apparatus was applied to the mouth, the patient respired largely and slept tranquilly, as one who had undergone fatigue. We noted nothing special, excepting an acceleration of the pulse, which rose from 72 to 90. After the operation, and so soon as the apparatus was withdrawn, the patient awoke. He did not appear at first to be able to render an account of what had taken place around him. But this state of astonishment, which showed itself in almost all our patients, at the termination of anæsthesia, is transient, and is completely dissipated in less than two minutes. This man, when questioned in regard to his sensations, replied that all had been to him a profound sleep, save only that he had a vague consciousness of the first incision, and he recalled the fact that at this period he had closed his teeth, but instantly after slept, and felt nothing more. An hour after we dressed the wound, when the patient told us that he did not experience any pain, and that when the finger was touched, it did not hurt him more than it would have done before the operation. The quantity of amylene employed was about twenty-five grammes.

Case III.—*Phlegmon of the hand; Incisions; Anæsthesia with amylene in two minutes.*—Nicholas Morbaux, *æt.* 35, robust constitution, was admitted into the Hospital Beaujon, affected with a suppurated phlegmon, and it was proposed to M. Debout by M. Robert, before opening the abscess, (March 6,) to put the patient under the influence of amylene. The patient inhaled without disgust, and breathed fully and regularly. In less than two minutes he was insensible to the prick of a pin and to a pinch of the integument. The pulse was accelerated, but less remarkably so than in the most of our experiments. No sign of contraction or agitation appeared. The operation consisted in a large incision comprising the whole thenar eminence, and in a second incision at the base of the nail. The patient was completely immovable under this double use of the bistoury. Inhalation was suspended at the end of three and a half minutes, and in about half a minute the patient was partially awake, appeared silly, and had an unsteady look. He replied, however, exactly to the questions addressed him, and pretended that he had felt perfectly all that had been done to him. But suddenly, and at the end of the second minute, all evidence of stupor disappeared. He looked at his hand, and could not restrain his surprise on seeing the two incisions from which the blood was escaping. There was no *malaise*, no agitation after the use of the vapor, and the pulse speedily returned to its normal condition. The patient slept almost the whole day. When interrogated in the evening, he said that he had felt absolutely nothing during his anæsthesia, but had had agreeable dreams. Like the other subjects, his appetite rapidly returned.

Case IV.—*Prostatic Calculi; Lithotomy; Anæsthesia by amylene; Inhalation for three-quarters of an hour.*—Jean Boucher, *æt.* 62, feeble constitution, entered into the hospital to be treated for prostatic calculi, the existence of which produced incontinence of urine, etc.

M. Robert proceeded to the extraction on the 6th of March. The patient, a man of a pusillanimous and irresolute character, demanded anæsthesia. Amylene was resorted to, but the effect could not be produced in less than half an hour. Powerfully impressed, and a prey to a profound terror, the patient inhaled bnt very imperfectly, in spite of the orders given him, and it was necessary to tell him again and again, that the operation would not be commenced till he became insensible. If we except the acceleration of the pulse, no important phenomenon occurred during this space of time. The vapors did not seem to give the patient inconvenience, producing no cough. Anæsthesia having been obtained, M. Robert proceeded to the operation, and the inhalation was continued.

Dnring the first half of the operative proceedings, the patient moved not, but the inhalation being suspended but a moment in order to charge the apparatus again with the anæsthetic, and this moment being prolonged, sensibility reäppeared, and the vapor appeared to lose its original power; the patient became agitated, and cried ont, and, at the same time there appeared contractions of the mnscles of the thighs.

When the operation was finished, the inhalations discontinned, having been kept up for three-quarters of an hour, thirty-five grammes of amylene having been nsed, the patient was in full conscionsness almost immediately. He said he had not felt the incision made with the bistoury in the perinæum, but that he was conscions of the removal of the calculi, without, however, feeling great pain. This sensation, however, was not very exact, for the patient asked, with great anxiety, to be disembarrassed of his calcnli, and M. Robert was forced to plunge his finger into the wound, to prove to him that the operation was terminated.

For abont an hour the patient fonnd his breath exhaling the odor of amylene, and he had a light cephalalgia for half an hour. He had no nansea, nor bad taste in the mouth, and he took nourishment on the same evening.

Since the operation, Boncher is doing well, the pain which existed before the extraction of the calculi having entirely disappeared. The long continuance of the inhalation has not resulted in the phenomena which manifested themselves immediately after the operation, and disappeared at that period.*

The mental as well as nnhappy physical condition of this patient, presented to us a special case, and we have not hesitated to sacrifice the *tuto* to the *cito*, and even to the *jucunde*.

This long continuance of inhalation of amylene is exceptional, in proof of which we here give a summary of eleven other *amylenizations:*

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* These cases have been collected by MM. Bernandot and Dayo, internes of the hospital.

2 Cases,	Anæsthesia in	1½	minutes,	Male,	*æt.* 25	and	28	years.
3 "	"	2	"	"	" 18,	34,	35	"
2 "	"	3	"	"	" 35,	Female	13	"
2 "	"	4	"	"	" 23,	"	23	"
1 "	"	4½	"		"	"	30	"
1 "	"	6	"		"	"	13	"

This rapidity of action is owing exclusively to the use of an apparatus, since in the two cases published by M. Tourdes, in which the anæsthetic was administered by means of a sponge and cone of paper, the period was much longer. Another circumstance of importance in relation to the apparatus is economy, as a supply of amylene is at present obtained with difficulty, and its price is high. It will be seen that, during an inhalation prolonged for three-quarters of an hour, as in Case IV, we have used only thirty-five grammes, whilst Professor Rigaud has consumed one hundred grammes in fifteen or twenty minutes. The apparatus also prevents the diffusion of the anæsthetic vapor in the room, not only incommoding the patient but also the surgeon and his assistants.

Art. III.—*On Infantile Thrush.* By Dr. Lebarillier, *Physician to the Bordeaux Alms House.* Translated from the *Journal de Médecine de Bordeaux, of March,* 1857, for the New Orleans Medical and Surgical Journal. By J. P. Barbot, Apothecary, New Orleans.

[*Concluded.*]

[According to the Mortality Statistics of the United States Census for the year ending June 30th, 1850, the deaths from thrush amounted to 424. Omitting 16 in seasons not designated, the residue is distributed through the seasons thus: spring 73; summer 110; autumn 156; winter 69. Of this number 91 died in the first week of life, and 178 over one week and under one month; one month and under three months, 65; three months and over, 38; unknown, 52.—Ed. N. O. Med. and Surg. Jour.]

PATHOLOGICAL ANATOMY OF THRUSH.

As sequelæ of thrush, the digestive canal often exhibits alterations which it is important to point out, and which show, in the severe form of this disease, the relation existing between it and other affections of the digestive tube.

When thrush is simple and even when confluent, if the child dies of of an intercurrent disease, it rarely happens that the mouth exhibits after death any very appreciable changes. If thrush had been very confluent at the time of death, this production, instead of being tenacious and difficult to peel off as it is during life, will have the appearance and consistence of a thick mush, of a dirty grey color, easily datached, either by the finger or the scalpel. I have never met with any ulceration or softening of the mucous membrane; in one or two instances, in cases in which the disease had been prolonged, it seemed to me to be paler and less injected than in the healthy state. The tongue was also paler, and exhibited manifest dryness. Billard and Valleix have mentioned pretty numerous alterations in the mouth: erosions, ulcerations, gangrene. The pharynx and œsophagus have exhibited much more important changes. M. Seux has noticed therein every change from a simple injection up to ulceration and even total destruction of their parietes by gangrene. In twenty-six post mortem examinations made by him, thrush had invaded the pharynx thirteen, and the œsophagus fifteen times. If we add to these observations the twenty-two cases examined by Valleix, it will be found that thrush had spread twenty-three times to the pharynx and thirty-two to the œsophagus. I have found thrush in the pharynx only in one case, and that in ten autopsies. I have not seen it in the œsophagus.

It is particularly when thrush has been very confluent and has invaded the whole of the mucous membrane, that the thrush formation is met with on the pharynx and œsophagus after death. Most generally it is easily detached. In most cases the mucous membrane is healthy; in others, on the contrary, it is red and injected with blood. M. Seux has observed *softenings* and *ulcerations* in the pharynx and œsophagus; he has also called attention to a peculiar condition shown by the mucous membrane in some cases; this condition is the first one described by him. The mucous membrane becomes *dense*, *resisting*, and offers a *parchment-like* aspect. This alteration which is only formed under a thick coat of thrush, is the consequence of inflammation. On two or three occasions, MM. Lédiberder and Seux have met with ulcerations on the mucous membrane of the œsophagus, concealead under the thrush-plates. These cases are very rare, and the epithelium is almost always unchanged, even under the thickest coats of the cryptogamous product.

The stomach exhibits traces of this cryptogamic production more rarely than the mouth, pharynx or œsophagus, but it evinces oftener than they do, alterations of an inflammatory nature, from an injected condition up to a jelly-like softening. The liquids found in the stomach also vary in consistence and appearance, i. e., mucosities, yellow or greyish matters and curdled milk.

In twenty-six post mortem examinations, M. Valleix found the stomach diseased twenty times; M. Seux in fourteen instances out of twenty-six autopsies. In ten subjects examined by me, I found three instances of diseased and a slightly hyperæmic stomach. I have never met with thrush in the stomach. The stoppage of thrush at the cardiac orifice or above it had caused it to be denied that thrush ever was produced in the non-epithelial digestive viæ; but the observations of M. Lébut—those of Billard, of Valleix and of M. Lédiberder, leave no doubt upon the subject. By adding the number of post mortem examinations made by these gentlemen to those made by M. Seux, we have a total of 123 cases, out of which thrush was found in the stomach seven times.

The frequent occurrence of disease in the small intestine in severe thrush is very remarkable. The alterations met with therein are very similar to those found in enteritis and typhoid fever. The mucous membrane is often red and inflamed. This redness exhibits itself in variable forms and degrees of intensity. In some cases there is softening. Ulcerations have been found also. The glands of Peyer are red and prominent or ulcerated. The small intestine generally contains some thin, yellow fluid. The ileum seems to be the part most generally affected. Thrush is found in the small intestine more rarely than even in the stomach. In the 123 post mortem examinations made by Billard, Valleix, Lédiberder and Seux, they only found it four times. The large intestine is less often affected than the small; in twenty-six cases examined, post mortem, by M. Seux, it was diseased seventeen times, three times alone, and fourteen times in connection with the small intestine. In two cases I have also found it red and its mucous membrane softened. Ulcerations occur more rarely therein than in other portions of the digestive tube. In five cases, M. Seux noticed on its mucous membrane a multitude of white granulations, of the thickness of a millet seed, embedded in its substance. These granulations have been found on the healthy mucous membrane also. This morbid alteration, pointed out by Valleix, does not appear to be anything else but an engorgement of the cryptogamic mucous membrane, which, under the influence of the disease, becomes developed and inflamed. The *rectum* is often invaded by this inflammation. Thrush in the large intestine has been pointed out by Billard, Valleix and M. Seux; their observations show one case in forty-one autopsies. MM. Bouchut and Ch. Robin have seen thrush around the margin of the anus. The *mesenteric glands* have been found altered in their appearance; this alteration coincided with the inflammation of Peyer's glands. No important observations were made on the *liver*, the *spleen* or the *kidneys*.

DIAGNOSIS.

Generally speaking, thrush is easily recognized: the development of the lingual papillæ, the appearance on the tongue of characteristic white spots, the rapidity with which these spread to the buccal mucous membrane, the secondary symptoms of inflammation of the bowels, easily indicate thrush in early infancy. The diseases with which it might be confounded, syphilitic apthæ and ulcerations, differ from it in their mode of evolution, their appearance and their duration. In thrush, at another period of life, there may be some difficulty in distinguishing very confluent thrush from ulcero-membranous stomatitis, which it resembles somewhat. The microscope would dispel all doubts, if any could exist; as one of the products, thrush is, as we have already shown, of vegetable origin, and the other is of a fibro-animal nature. If we consider thrush as confined to the œsophagus and stomach, as Valleix has cited an instance of, the diagnosis will be difficult, unless the child should vomit up shreds of thrush. I have never met with cases in which there had been any secretion of thrush in any portion of the intestinal tube, unless it had first appeared in the mouth. The symptoms in that case would be those of enteritis. Tenderness on pressure, pointed out by Valleix as indicating the presence of thrush in a precise portion of the intestine, is not peculiar to thrush, and the passage in the stools of some portions of thrush would not indicate in a positive manner the existence of thrush in the bowels; in these cases it may have come from the œsophagus. Finally, our observations, including those in hospitals for children, lead to the conclusion that thrush in the mouth is easily recognized.

PROGNOSIS.

Between the belief of Valleix, who has seen thrush almost constantly fatal, and the opinion of M. Bouchut, who pretends that thrush has never killed any one, where shall we find the truth? The prognosis of thrush must vary according to the localities in which it is observed, and the nature of the symptoms it exhibits. Simple, discreet thrush is everywhere innoccuous and does not appear ever to have caused any unpleasant consequences. Such is not, however, the case with confluent thrush, complicated with enteritis.

The difference in the results obtained in Paris, and in the hospitals in the south of France, in Marseilles and in Bordeaux, is very remarkable.

In Paris, Baron lost one hundred children out of one hundred and forty; Valleix, twenty-two out of twenty-four; MM. Trousseau and Delpelch saved twenty-three out of forty-eight.

In the Marseilles Charity Hospital, out of four hundred and two cases, M. Seaux lost but tweuty, and in the year 1854, out of two hundred and thirty children, thirteen ouly died of thrush.

In Bordeaux, from September 1st, 1855, to September 1st, 1856, out of three hundred and fifty children attacked by thrush in the nursing wards, I have fouud but eighteen deaths due to thrush.

To what iuflucuce are we to attribute so great a difference in mortality? Is it to climate, or to the peculiar conditious in which uewly born children are placed? M. Seux, in his excellent work, gives an explanation that seems to me the most rational on the subject. In the Foundling Hospital of Paris, childrcu attacked by thrush, are separated from their wet-nurses for fear of contagion. It will be readily understood, that a child already ill, when deprived of its natural nourishment, will soon perish. What would seem to prove this, is the fact that, in the Necker Hospital where this method is not followed, the mortality is less.

Generally speakiug, thrush is more or less severe, according as the intestinal symptoms are more or less serious; children almost always die in consequence of the enteritis. The disease is also much more severe in our hospitals than elsewhere. I have never seen thrush terminate fatally in private pratice.

TREATMENT.

The treatment of thrush must depend upon: 1st, whether it be simple and discreet; 2d, whether it be confluent and complicated by enteritis.

The first thiug to be done is to withdraw the child from the causes which have developed the disease. If the thrush be simple and discreet, frequent applications of mucilaginous water to the mouth by means of a pledget of lint will be sufficient in most cases. M. Guersant advises the addition to the infusion of malva, of althæa or flax-seed used for the purpose, of one-fourth part of liquor sodæ chlorinatæ or of lime-juice. He has also successfully used a very weak solution of alum. These means, iu connection with full baths, will always insure a cure in simple thrush.

In the severe and confluent form, with enteritis, the inflammatory symptoms must be carefully watched. The treatment should be as much directed to the intestinal inflammatiou as to the development of thrush. To combat the confluence of thrush, vegetable acids have been recommended (Dugès); a solution of sulphate of zinc, of one gramme to thirty grammes of lettuce water (Keucker); calomel mixed with sugar, and given in half grain doses two or three times a day (Brettouneau).

In the Necker Hospital, M. Trousseau always used, and constantly with success, the following applications:

Borax, ...	5 to 15 grammes.
Honey, ...	equal parts.

The diseased parts were to be moistened three times a day with the above by means of a pledget of lint. (Bouchut, *op. cit.*, page 478.) The nitrate of silver in stick was also used to cauterize the thrush formation in its confluent form, and to arrest its development. A new application, the *chlorate of potassa*, employed with success by Dr. Isambert, in diphtheritic affections of the mouth and throat, was tried in the Bordeaux hospital, either as a *collutorium* mixed with honey, or given internally in a mixture. We have derived no benefit from its use. This was also the case with most of the treatments mentioned above. Mucilaginous decoctions, either simple or with slight additions of alum or of sulphate of zinc, (one gramme to two hundred of the decoction) and full baths constituted all the treatment for thrush in our hospital. This method has always succeeded with us. The child should take the breast less often in order not to fatigue its mouth, or it should be fed with the nurse's milk given in a spoon.

If the thrush be complicated with enteritis, you should insist upon the frequent exhibition of full baths, mucilaginous applications, warm fomentations and poultices of flax-seed meal over the abdomen, and starch injections. The preparations of opium and of bismuth have not appeared to me to be called for in these cases.

The *erythema* and *ulcerations of the malleöli* should be treated with emollient washes, simple dressings, and in seeing that the children be *kept as clean as possible.* Independently of this curative treatment, the physician in hospitals for children should attend to another; the object of which would be to prevent, if possible, the production or the spread of this disease—in a word, a prophylactic treatment.

In our large cities, Paris, Marseilles, Bordeaux, where there are alms houses and hospitals for infants, thrush exists endemically. In Bordeaux, at least, it is continually raging in our wards. To what are we to attribute this permanence of the disease, unless to the crowded condition and ill distribution of our hospitals? This important fact has attracted the attention of our learned board of administrators on hospitals, and in a remarkable report, M. Gintrac, director of the Medical College, whilst he pointed out the evil, at the same time offered the remedy, which consists in a better construction and distribution of an hospital for children. Our alms house consists in a large room in which are forty beds or cribs almost always occupied, and we have no infirmary to separate the sick from the well. In order to guard against a disease which, if it does not carry off many children, reduces them to a condition of weakness and debility which it is often very difficult for them to get over, it appears to me indispensible that they should be separated from one another, and be promptly sent away into the country.

The prophylactic treatment then should consist in giving free access to fresh air in the wards, in placing the cribs and beds further apart from one another, in isolating the sick as soon as they are attacked, and in changing the diapers and clothes as soon as they are wet. The nurses (as counselled by M. Seux) ought to take exercise in the fresh air several hours during the day, and take a bath once a week. Every time they will have given suck to a child seized with thrush, before suckling another, they should wash their nipples several times with chlorinated washes, so as to destroy the spores of the cryptogamic production that may remain concealed in the folds of the nipple. The child should never be weaned from its natural suck, for the nursing bottle and panadas are injurious to children suffering with thrush.

ART. IV.—*Researches on the Anæsthetic Effects of Amylene.* By M. G. TOURDES, Professor in the Medical Faculty of Strasbourg. *Translated from the Gazette Médicale de Strasbourg*, by M. MORTON DOWLER, M. D., New Orleans.

[The present is a second article by the same able professor, the first having already been translated by us for the May number.]

AMYLENE.

THE history of Amylene has been enriched with new facts, which will still better enable us to appreciate the value of this anæsthetic and the special indications for its use. In addition to the article which we contributed to the *Gazette Médicale de Strasbourg* for February, (the same article which we translated for the May number of this journal from the *Gazette Hebdomadaire de Médecine et de Chirurgie* for March 6, 1857—*Trans.*) we here produce a second article which is demanded by further observation in relation to Amylene. Our researches bear on the following points: 1st, the purity of Amylene; 2d, the proper mode of Amylenization; 3d, the application of Amylene to obstetric practice, and its medicinal employment; 4th, its application to anæsthesia in cases of children.

1.—THE PURITY OF AMELYNE.

This question is of paramount importance; and it is a complicated one, and less easy of solution than might at first be supposed. M. Hepp in his first note recommends washing the Amylene with sulphuric acid. Numerous experiments, made on a large scale, soon proved that sulphuric acid does not fail to alter Amylene, and even to destroy this substance. When Amylene is washed with one-fifth part of sulphuric acid, a volatile product is obtained, the odor of which is no longer that of pure Amylene, the product presenting, in a feeble degree, an after-smell resembling sassafras wood, and which persists for an instant after the true odor of Amylene is dissipated. If the mixture be made in equal parts, the Amylene is decomposed, sulphurous acid is disengaged, and no trace of the odor of Amylene remains. The residuum is a body which is entirely different, and the nature of which Mr. Hepp has not been able to determine.

The result of these experiments go to show that the use of sulphuric acid ought to be abandoned, or, at least, that it ought to be used only feebly, and at the very commencement of the process. The only rational and certain means of obtaining pure Amylene is by repeated distillation. It is proper to separate the products into parts, and to collect only the portions which are most volatile, by which means the Amylene cannot fail to gain in relation to its purity and odor. M. Debout, chief editor of the *Bulletin Thérapeutique*, has borne witness to the advantage of this procedure.

The Boiling Point.—This question which seems to have been formerly determined is still a subject of controversy. The boiling point, according to M. Hepp, is between 20° and 30°, he not having, up to the present time, been able to determine the point more precisely. The specimens employed in the investigation of this subject were as pure as possible, being rendered so by repeated distillations and divisions of the products. The following facts have been determined: at 20° the ebullition commences, and it obtains its maximum between 30° and 35°. It continues without interruption up to 40°, and even higher, without the possibility of determining, with fixity, the point at which the continuance of ebullition is unaccompanied with further elevation of temperature. M. Debout (*Bulletin de Thérapeutique, March,* 1857, *p.* 214,) has determined the variability of the boiling point. "The flask of Amylene," says he, "which has been sent to us from London by Dr. Snow, boils at 31°, and that which is prepared by the house of Ménier, of Paris, has its boiling point at 28°. Neither the one nor the other, then, is chemically pure. The greater the volatility of the drug, the more rapid its action, which, in an anæsthetic point of view, is an incontestible advantage."

Does Amylene change its properties during ebullition, as is the case with many other of the hydro-carburets? Nothing, it is true, up to the present, goes to demonstrate the affirmative; but M. Hepp has found good reason to consider it very probable.

Distilled Amylene has been collected separately at 33° and upwards, and it has been obtained at a higher temperature, rising to 35° or more. The first product has a feebler and more bland odor. This is the sort of Amylene which is employed for medical uses at Strasbourg.

The purity of this product, then, is with great difficulty tested by the boiling point which is destitute of the degree of fixity necessary to serve as a guide. The density will doubtless furnish some guide, but this may vary according to the particular fraction of the product tested. The indications are wanting when we attempt to characterize a *type* of Amylene.

It has been attempted to determine by the odor of Amylene, when a small portion is evaporated from the hand, the question of purity. Up to the present, the process of repeated distillations, is the only guaranty of the purity of Amylene. By this test of evaporation, Amylene adulterated with foreign substances, as chloroform or alchohol, may be very readily distinguished.

M. Hepp now obtains with great facility, and at a reduced price, an abundance of Amylene. He employs in its preparation, the chloride of zinc, to the exclusion of every other reägent. This chloride is so highly concentrated, that it acts in masss, by refrigeration. This body is to be left in contact with Amylic alcohol for two days, keeping the two bodies in the solution at a low temperature. The first distillation is then practised, which disengages all the volatile products; after which a second distillation is to be made, at a temperature rising to 100°, which is to be followed by a third at 50°. The distillation is to be terminated between 25° and 33°, by collecting the most volatile parts of the products. The price of Amylene prepared at the civil hospitals of Strasbourg is from sixteen to eighteen francs per kilogramme. This is the actual price of chloroform at 4500° of density, prepared in the same establishment. Hence, it will be seen that the price of Amylene is no longer an obstacle to its general use.

II.—MANNER OF EMPLOYMENT.

The great volatility of Amylene is a difficulty in the anæsthetic application of that agent. Precaution ought to be taken that there be not too great a waste of the anæsthetic, and that there be a concentration of the vapor in the respiratory passages. The greater number of the physicians who have noted the quantity employed during their operations, speak of the amounts as varying from thirty to one hundred grammes, and even more. Many operators have failed in their attempts, owing to the great volatility of this substance, and the imperfection of their operative appliances. It is important, then, to regulate its employment. Is it necessary, in the application of Amylene, to have recourse to apparatus analagous to that which is required in the use of ether? Or can we, on the contrary, administer the new agent by appliances as simple as those which are found sufficient in the administration of chloroform? This question it is of importance to determine; and perhaps the future reputation of the drug depends on the solution. We are of the opinion that the necessity which exists for the use of an apparatus, will greatly restrain the anæsthetic use of Amylene. The line should be drawn between children and adults on this point. In relation to the former, the question is already solved, for an Amylened sponge placed in a cone of waxed cloth, open at the apex in order to admit the air, the sponge being placed near the child's mouth and nostrils, is all that is necessary to the production of anæsthesia, with certainty and rapidity. The evaporation is much less rapid than with the paper cone, or with a simple compress. Indeed, the congelation which so rapidly covers the sponge in the paper cone, or on linen, is greatly diminished in the cone of waxed cloth. It is very true that we have consumed great quantities of Amylene—thirty-five, twenty and fifteen grammes—in cases of children; but with any attention to economy, we might have succeeded with much less. In operations of this kind, but little attention is paid to economy, and the amount employed in no way corresponds with the amount actually utilized. I have no doubt that, with common precaution, the anæsthetic dose in children might be reduced as low as fifteen grammes. In respect to adults, the problem is more difficult, and does not appear to be fully solved. It has been fully shown that by means of a simple handkerchief or compress, as is applicable in the use of chloroform, success cannot be obtained without the employment of enormous quantities of Amylene. This facility in the administration of chloroform weighs immensely in its favor, and counterbalances many inconveniences; but it must become a subject of deep regret, if any consideration of this kind should operate against so useful a discovery, and that the consideration of innocuity should be lost sight of in view of mere facility of application.

By means of a sponge surrounded by a double compress of waxed cloth, Professor Rigaud has often succeeded. In six cases the success was complete; but in three the Amylenization was insufficient, and in the amputation of a leg it was found necessary to abandon the new agent, and resort to chloroform. Professor Schützenberger, on the other hand, has produced anæsthesia in an adult in two or three minutes, and at two doses with twenty-five grammes of Amylene poured on a sponge surrounded by a compress. Dr. Debout has declared in favor of the use of apparatus, employing that of Charrière, so modified as to contain double the number of turns of the diaphragm contained in the body of the instrument, in order to afford a greater surface for evaporation. This promises to realize great economy in the use of Amylene. With one hundred grammes of this substance he has produced six or seven anæsthesiæ. The result obtained by M. Debout, in eleven cases, shows the efficacy of his mode of administration.

Notwithstanding all this, however, the employment of apparatus is a difficulty and an embarrassment; and may it not be attended with danger? In the use of anæsthetics every thing which can lead to restrain the respiration ought to be avoided; and on this score, perhaps the use of apparatus may be attended with evils. The apparatus is a subject of preöccupation, if not of fear, on the part of the patient; and, on the part of the physician, it gives rise to a complication, of which he would fain be relieved.

This discussion is important for the future of Amylene. We may sum up the subject in the following terms: 1, in case of children the question is solved, apparatus being useless and the cone of waxed cloth being sufficient; 2, in case of adults, they may be anæstheticized in the same manner; but the interposition of an apparatus will perhaps render anæsthesia more prompt and easy by regulating the employment of Amylene. This practical point must be better determined by future experiment.

III.—OBSTERIC APPLICATION.

In England Amylene has been employed with success for the annihilation of pain during the last period of labor; and it has been found that the anæstheticism has in no wise tended to enfeeble the uterine contractions.

In the obstetrical clinic of M. Stoltz, Amylenization has been resorted to in two cases.

CASE III.—*Accouchment; Incomplete Anæsthesia; Unconsciousness of pain during the last throes of labor.*—Madeline W., *æt.* 26, pregnant for the second time; entered the hospital on the 23d of February. The labor commenced at two o'clock, and at nine the neck of the uterus was effaced, the os tincæ dilated, and the head was engaged in the superior strait. The labor continued with regularity, and at a quarter past one o'clock, A. M., when the head rested in the hollow of the sacrum, M. Levy, *interne* of the service, had recourse to Amylene, which was poured in a scent-bag in form of compress, and enclosed in double waxed cloth.

The woman uttered cries, became rigid, and after five minutes inhalation, anæstheticism began. A contraction of the womb came on, the woman moaned, but much less strongly than before the inhalation, and at half-past one, the Amylene was renewed. In five minutes the woman became unconscious, and a contraction came on with some moaning. At two o'clock the head was expelled during a third inhalation, which also produced unconsciousness. The woman cried out at the moment of the termination of labor. When questioned with regard to her sensations, she said she had experienced vertigo, ringing in her ears, and a burning sensation in the pharynx. She could recall all that had passed, but she had no sense of labor pains. The child was living and healthy. The anæsthetic was thrice resumed in this case; the anæsthesia was incomplete, transient, but sufficient to destroy, or at least, to greatly mitigate the sensation of pain. The anæsthetic had no effect on the uterine contractions.

CASE IV.—*Insufficient contraction*; *Incomplete Amylenization; Application of Forceps.*—Catharine H., *æt.* 24, pregnant for the second time, entered the hospital March 14th; duration of labor twenty-four hours; began with the irruption of the liquor amnii; pains at long intervals and slow, but at each contraction the head appeared at the vulva. Professor Stoltz deemed it proper to resort to Amylene, to spare the woman the last pangs of labor, which he applied in the manner described in the preceding case. After a few minutes inhalation, the woman struggled and endeavored to tear away the apparatus; and in ten or twelve minutes she appeared to be affected with a kind of inebriation, in consequence of which she sunk down, without, however, losing consciousness, and without falling into muscular relaxation. No uterine contractions occurred during Amylenization, frictions strongly made over that organ, not bringing about any repulsive pains, the womb contracting only for an instant, to fall again into relaxation. M. Stoltz found that the pulsations of the fœtal heart descended as low as sixty in a minute, and he determined to bring the labor to a close by the use of the forceps. The application of the instrument was effected without difficulty, and the woman felt neither the introduction of the forceps nor the tractions necessary to delivery of the head, her declarations being distinctly made on this point. During Amylenization she experienced a degree of vertigo and dryness of the mouth. The child was living, but born long before its time. A few moments after delivery it fell into a state of asphyxia, from which it promptly rallied. Two days after the operation, the woman was attacked with peritonitis. M. Stoltz noticed in this case the rare symptoms of dryness of the tongue and lips. Had this symptom any connection with Amylene as producing dryness of the mouth, in opposition to chloroform which increases the flow of saliva? It is not probable that Amylene had anything to do with the inefficiency of the uterine contractions, and in the threatened asphyxia of the child. The birth was premature, and the labor continued forty-eight hours before Amylene was employed.

These two cases are but first attempts, resulting in incomplete success, but which fully authorize new trials of Amylene in obstetric practice.

The employment of this anæsthetic in general medical practice, is a subject demanding consideration. It is not to be doubted that this substance may be made to render important services in a certain class of diseases, and that it may be made to supercede chloroform in cases in which it is important to superinduce a light anæsthesia, which is rapidly dissipated. Professor Schützenberger has had the kindness to communicate to us the following case:

Case V.—*Periodical Spasms of the Limbs; Amylenization; Cessation and return of the symptoms; Duration of the attack diminished.*—X., *æt.* twenty-two, was laboring for some days under periodical attacks of spasms, affecting the inferior extremities, and which sometimes invaded the superior extremities also. These symptoms appeared to originate from a chronic affection of the sheath of the spinal marrow. The attacks reäppeared about every fifteen hours. Left to themselves, they lasted about twelve hours. They disappeared promptly under chloroformization; but at the latest attack, the spasms returned at three distinct paroxysms after the anæstheticism ceased.

On the 18th of March the patient was attacked at half-past seven o'clock in the morning, and the left lower limb was violently contracted, the thigh being bent on the pelvis, and the leg on the thigh, the spasms extending to the toes, sensibility being completely abolished. In place of employing chloroform as before, M. Schützenberger resorted to Amylene, ten or twelve grammes, being poured on a sponge fixed in the vase of compress.

In about two or three minutes anæsthesia was complete, it being produced as rapidly, at least in this case, as it had been by chloroform. During the inhalation, spasms of the pharyngean muscles were observed, and the relaxation of the limbs was preceded by efforts to vomit. The contractions ceased under the use of Amylene, and the patient remained plunged in a profound anæsthetic sleep. For a minute from the moment of relaxation of the limbs, intelligence appearing, correct replies were made to the question propounded. Five minutes after, the cramps reappeared, with all the intensity they exhibited before the amylenization.

A renewal of the application of Amylene was resorted to in this csae, in the same doses, but the drug was not pushed to anæsthesia, owing to the violent spasms which supervened. During two trials the pulse was sensibly accelerated—no trace of cyanosis was observable. The attack of spasms did not appear till noon, its duration was shortened, and no consecutive unfavorable result occurred.

IV.—ANÆSTHESIA OF CHILDREN.

The efficacy of Amylene in the production of anæsthesia in children, appears to be well established in practice. We shall proceed to the exposition of the facts on which this view is based, and to deduce from these facts conclusions touching the value of Amylene, and the indications for its use in infantile practice.

Doctor Giraldès, *agrégé* of the Faculty of Paris, has communicated to the Surgical Society the results of twenty-five cases of anæsthesia produced in children by Amylene. The results obtained are conslusive in favor of this substance. The ages of the children were from three months to ten years. The Amylene used was prepared by M. Rousseau. The time required for anæstheticism varied from one to three minutes. All of the children respired the drug without effort, and without much resistance. The respiration was calm and normal, and anæstheticism was obtained without nausea or vomiting; though Amylene had been many times resorted to in a short time after a light repast. Neither paroxysms of coughing, spasm of the larynx, closure of the jaws, nor cephalic congestion was observed. The resuscitation was rapid, the reëstablishment prompt and complete, without consecutive symptoms.

We have pushed our inquiries into the clinic of the diseases of children. We shall now give, at some length, five cases which exhibit the effects of Amylene, and show its efficacy and innocuity.

CASE VI.—*Child seven months old; Phimosis and Ulceration of the Prepuce; Amylenization of eight minutes continuance; Circumcision.*—Eugène K., aged seven months; brought to the hospital March 7th. General phimosis with balanitis, and swelling of the prepuce, which displayed at its free margin an ulceration indurated at the base. The scrotum presented at its anterior part two superficial ulcerations, resembling mucous pustules, the opening of the prepuce contracted, and the emission of urine accompanied with acute pain—the general health unaffected. Circumcision was decided on, and Professor Michel took charge of the operation.

The little patient resisted, wept and fretted without exhibiting however, any sign of well-marked repugnance. Its cries became feebler and feebler, and in about one minute and three-fourths, it became somnolescent, the eyes being slightly open, the respiration accelerated, and the pulse eighty. This sleep was not accompanied with muscular relaxation, but the limbs did not acquire any ridgity. The Amylene was withdrawn and the operation was commenced. The prepuce was removed during this first anæsthetic period, but in less than a minute the respiration became accelerated, and the little patient exhibited signs of sensibility. The sponge was again charged with the Amylene, and the cone was newly applied to the face, and in less than a minute the anæsthetic sleep was produced anew. M. Michel profited by it in the excision of the flaps of the mucous surface. The Amylene was removed, and at this time the anæsthesia continued at least a minute and a half. The respiration then became accelerated anew, and the child began to stir. The Amylene was applied the third time, and insensibility was speedily produced, the little patient becoming motionless. Three pins were applied which served to reunite the mucous surface to the skin. Sleep continued more than two minutes. A fourth application of the anæsthetic was made, in order to facilitate the dressing, which produced a more prolonged sleep than the preceding; the child then became half awake, and remained for two or three minutes without complaint, looking around himself, almost immovable, without making any opposition to the dressing that was being finished. He soon came completely to himself, struggled and cried as before the operation. This agitation continued about a quarter of an hour, the cries being evidently occasioned by the pain. The little patient became calm at last, and rested tranquilly in his bed, without the occurrence of any consecutive effect from the action of the Amylene.

The operation continued from eight to nine minutes, thirty-five grammes being employed. The application was suspended as soon as the sleep was produced, and the anæsthesia superinduced by the four separate administrations, continued in all about eight minutes. The laxity of the limbs was never complete; but a sufficient immovability was obtained without rigidity of the muscles; and the sensibility was completely extinguished. There was no nausea; the child had taken a soup of milk two hours before the operation. The eyes remained half closed, the globe of the eye being lightly convulsed upward. The respiration was very much accelerated, eighty-four in a minute being the maximum, and there was panting at the moment when sensibility began to return.

As a prolonged insensibility was not required, the Amylene was immediately withdrawn so soon as the child slept; and the renewal was made at the first signs of sensibility. The duration of the anæsthesia each time, varied from one to two minutes; at the third and fourth applications, it continued longer than at the first and second, and it would have been easy to produce a still longer and more profound sleep, by repeating the Amylenizations. But the object sought was exactly obtained, which was to obtain a sufficient anæstheticism for an operation of short continuance and it was unnecessary to go further.

CASE VII.—*Child four years old; Granular Ophthalmia; Amylenization continuing for four minutes; Cauterization.*—Catherine B., *æt.* four, enfeebled by chronic diarrhœa, was attacked with granular ophthalmia. The eye-lids were tumefied, the palpebral conjunctiva was suppurative and photophobia was extreme. On the 16th of March it was decided to cauterize the granulations.

To Amylenize the patient I employed a cornet of waxed cloth, with a sponge in the base. The cornet was of little depth that the sponge might be in close proximity to the entrance of the respiratory passages, the vacant space engaging the mouth and nostrils, the apex being pierced with holes to admit the entrance of the air. The sponge was charged, and the cornet applied, the child weeping and resisting, but without showing any strong repugnance to the vapor. In one minute the cries ceased, the child becoming insensible and immovable without muscular laxity. The cornet was renewed, and the eye-lids were examined, but almost immediately signs of sensibility appeared. A new charge of the sponge and re-application made with insensibility in less than a minute, when both of the right eye-lids were cauterized. The apparatus being removed, the child again revived. Amylene a third time—rapid insensibility—other eye cauterized—sensibility began to return in half a minute, and there was a resumption of speech in one minute—intelligence complete in three minutes—the child crying out, and accepting at the same time an offered *bon bon* that it grasped strongly while continuing to cry—operation of four minutes continuance, during which anæsthesia was maintained by the consumption of twenty grammes of Amylene—with little economy, much less would have been sufficient—insensibility accompanied with almost complete immobility, and without muscular laxity. There were neither contractions nor fibrillary trembling—no nausea—no salivation—respiration accelerated —pulse frequent—the child panting, when sensibility began to appear.

Case VIII.—*Child two years and a half old; Severe Contusion of the Thigh; Amylenization of five minutes duration; Diagnosis.*—Marie B., age as above, of vigorous and strong constitution, fell from her bed on the 16th of March, and was carried on the next day to the hospital. The child suffered severe pains in the right thigh which was much swollen, and a fracture was suspected. The examination of the limb caused the child to scream loudly with pain. Amylenization practised on the 18th of March, with a view to a precise diagnosis—Professor Michel assisting in the operation. Amylene was poured on the sponge which was enclosed in a cornet of waxed cloth, and applied to the mouth and nostrils—child cried, but without showing any repugnance to Amylene—was preöccupied with the dread of having the injured thigh touched—coughed once—cries ceased in about a minute—insensibility in two minutes—eyes turned upwards and inwards—muscular laxity incomplete—no rigidity of the limbs—accelerated respiration. The Amylene was then withdrawn, and in half a minute the sensibility tended to a return—Amylene renewed—anæsthesia almost immediately reäppearing; and this time the beginning of muscular laxity of the limbs manifested itself. The sleep lasted about five minutes. The absense of fracture was ascertained. In one minute after Amylenization, the patient began to cry, and in two minutes full consciousness was reïnstated, the child accepting *goodies* which were offered it, though continuing a cry which it soon left off. The amount of the drug employed was fifteen grammes.

M. Rigaud has produced complete anæsthesia in three children of the ages of twelve and fourteen years.

Case IX.—Adèle W., *æt.* twelve—case of club-foot—anæsthesia with Amylene in the sponge and cornet as before—full effect in three minutes—tendo-Achillis was divided—consciousness returned with the withdrawal of Amylene—reäpplied—a little muscular rigidity became visible, which soon gave place to a complete laxity of the muscular system—Amylene continued to the end of the operation, involving the section of the plantar aponeurosis, and the adductor of the great toe—total period of anæsthesia eight minutes—continuance of anæsthesia after the withdrawal of the Amylene, one minute. The patient returned to herself without being able to recount what had happened. She was perfectly reïnstated at the end of two minutes, and experienced the necessary sensation of pain resulting from the operation—no nausea—patient took milk in an hour after the operation.

Case X.—Marie L., *æt.* fourteen—whitlow—agreed to be Amylenized without hesitation—at the end of three minutes a little muscular rigidity observed—eyes convulsed—anæsthesia complete almost immediately—sleep tranquil—the whitlow incised—the drug withdrawn—return of consciousness prompt—related her dreams, and knew not that the incision had been made; and it was only some minutes after her awaking, that she felt the pain of the incised finger return. There were in this case a little cephalalgia and nausea; but these symptoms soon disappeared.

RECAPITULATION AND CONCLUSIONS.

These several cases leave no doubt whatever in relation to the efficacy of Amylene as an anæsthetic in cases of children. We shall recapitulate, in a few words, the advantages of Amylenization it this behalf: Children inhale Amylene without repugnance, this substance neither irritating nor fatiguing the respiratory passages. No apparatus is necessary to anæstheticize the little patient, the sponge and the cornet of waxed cloth being all that is required.

The anæsthetic action is rapid, rarely exceeding one or two minutes.

The insensibility is complete without the necessity of producing laxity of the muscular system. It is much easier with Amylene to keep within the degree of effect which is intended to be produced than with chloroform—much easier to keep up a superficial and transient effect proportioned to the object sought to be attained. We here insist on this important difference in the anæsthesia of children; with chloroform we often realize its effects more strongly than we desire, bringing on a profound somnolescence, and a complete resolution of muscular power, whilst with Amylene we are very nearly certain not to produce these results when we do not seek to produce them by a persistent inhalation.

If we have need of producing a profound anæsthesia accompanied with a resolution of muscular power, these results can be produced also by Amylene, by sufficiently prolonging its action.

M. *le docteur* Debout maintained a patient in a state of insensibility by Amylene for three quarters of an hour; but here lies another important difference between this substance and chloroform. No sooner has the inhalation of Amylene been suspended, than the effects diminish rapidly, its absolute insolubility and excessive volatility result in the rapid elimination of this substance, and the prompt disappearance of the symptoms. But with chloroform, on the contrary, the volatility is much less, the effects are more prolonged and sometimes they become more grave after the inhalations have ceased. We see sometimes in children the sleep uselessly prolonged from twenty minutes to half an hour after the operation. Anæsthesia is a diminution of life, a sleep towards death, and it is important that it should not be prolonged an instant beyond the period which is absolutely necessary, such prolongation being always perilous.

The awaking is prompt and rapid with Amylene. The consequences of a short anæsthesia are seen only for five or six minutes, and two or three minutes are sufficient to restore the child to the plenitude of his faculties. This return is a little retarded when the anæsthesia has been protracted. Up to the present there has been no untoward result in the use of Amylene. The elimination is rapid, and the traces of Amylene are promptly effaced. Every thing proves that a prolonged Amylenization does not produce any secondary lesions; even with chloroform the secondary phenomena are but little recognizable. In an hour after a profound anæsthesia, I have often seen the little patients resume their sports, or quietly take their repast.

Another fact which appears to give a manifest advantage to Amylene, is the absence or great rarity of nausea and vomiting, an advantage which has been always observed in its use. I have never seen these symptoms present, though the little patients were anæstheticized only two or three hours after eating. M. Giraldès has seen neither nausea nor vomiting in any of the twenty-five cases he has collected, even when the children had eaten but a little time before Amylenization. This is a characteristic advantage, and is of high practical importance. But nausea and vomiting, though rare, may nevertheless occur. MM. Rigaud and Schützenberger have seen nausea occur; and M. Debout has also shown that it may attend the use of Amylene.

Under chloroform, on the contrary, nausea and vomiting are amongst the very ordinary symptoms. In the chloroformization of a child which is not absolutely fasting, these symptoms are great inconveniences. Two or three hours after eating, I have seen vomitings occur, the nausea commencing with the inception of anæsthesia, or, indeed, at the moment when the stupor begins to diminish. The vomited matters come up and are drivelled from the buccal cavity while the child is unconscious. This spectacle has in it something painful and alarming. Though no accident be produced, it is, nevertheless, natural that we should fear that the vomited matters might find their way into the bronchia. I fell into the invariable rule of subjecting children to a fast of four hours, at least, before applying chloroform. Under this point of view, Amylene possesses an incontestible advantage over chloroform. The former is less dangerous, and it permits a recourse to anæsthesia in a much less time after eating.

[Here Professor Tourdes quotes a long extract from the memoir of M. Debout, on the action of Amylene. The whole article of M. Debout we have already translated and published in the New Orleans Medical and Surgical Journal—*Trans.*]

The innocuity of Amylene is theoretically indicated by the volatility and insolubility of this substance; and the truth of the theory is physiologically demonstrated by experiments on animals. We have seen rabbits succumb under the action of chloroform and ether, under circumstances in which they resisted Amylene. The superiority of Amylene over ether is placed beyond all doubt by M. Debout. He has shown that when two birds are placed in two atmospheres, each of the cubic extent of two litres, and ether to the amount of one gramme and thirty-five centigrammes is poured into the one, and Amylene to the same amount is poured into the other, at the expiration of one minute the one of the birds will succumb, and the other will revive, affording a new proof that Amylene is less noxious than ether. The fact is explained by the insolubility of the Amylene in water, and consequently its insolubility in the blood.

The cases in which it has been applied in human subjects are not yet sufficiently numerous to admit of practically determining the superiority of Amylene in regard to innocuity; but the analysis of symptoms, in connection with what is already known, is in accordance with the conclusions deduced from experiments on animals. We must, however, guard against reposing on a false security. Anæsthesia is always a peril, with whatever agent it may be brought about. Without speaking of unforeseen syncopes, which seem to set the prudence of operators at defiance, the lightest cause which may impede respiration may suddenly occasion death. We can bear witness to this from what we have observed on animals.

From the whole of these considerations, we have no hesitation in the conclusion that Amylene will be made to render important services in the treatment of diseases of children. Its general characteristics are facility of application, certitude of effect, innocuity in result. To this we may add the rarity of nausea and vomiting, the possibility of producing, at will, an anæstheticism, light or profound, transient or durable, and with or without the resolution of the muscular system, and a rapid resuscitation without consecutive untoward symptoms.

If we consider Amylene and chloroform relatively in respect to the indications for their use, we must conclude that in the cases in which it is desirable to produce an anæsthesia of short duration, as in painful examinations, with a view to diagnosis, or in rapid operations, Amylene is to be preferred; but that we should leave to the domain of chloroform the profound anæsthesias necessary in great operations, and in which the surgeon is not permitted to preöccupy his mind with the apprehension of a too sudden awaking on the part of his patient. But we ought not to speak in advance of the actual results of experience. The decisive fact in question is undisputed—the innocuity of Amylene; and if, in this point of view, observation confirms the first givings-out of science, there can be no doubt that Amylene will occupy an important place amongst the substances which now secure the great blessing of the annihilation of pain.

Art. V.—*Chemical Researches on Amylene.* By M. Duroy. A memoir communicated to "*l'Académie Impériale de Médecine,*" of Paris. Translated from *l'Union Médicale*, of April 7 and 9, 1857, by M. Morton Dowler, M. D., New Orleans.

[In rendering this memoir into English, we have been compelled to abridge and condense the same to a considerable extent. M. Duroy after considerable preliminary discussion, asserts what will be found to be subsequently proven by him, that in the amylenizations which have been practised in London and Paris, nothing like pure amylene has been used—the amylenes of MM. Hepp, Ménier, Snow, etc., not being at all identical with the C^{10} H^{10} of M. Balard, the discoverer of amylene. The following is the principal matter of the memoir. It will be seen that the production of the amylene of Balard is, in the midst of present resources, one of the most tedious, delicate and difficult operations known to chemistry, and withal expensive.—*Translator*.]

PROPERTIES OF POTATO-OIL.

Potato-oil, which also bears the synonymes of *amylic alcohol*, the *bihydrate of amylene*, and the *hydrate of the oxyde of amylene*, (*fusel oel*, of the Germans,) in the form in which we obtain it from the potato distilleries always contains ordinary oil—to such extent, indeed, that it is not rare to find it in the proportion of fifty per cent. The potato-oil is, moreover, most generally colored, and presents a burning, penetrating and disagreeable odor which sensibly diminishes during rectification. It is of much importance to purify the potato-oil, which is used for the preparation of amylene; for without this precaution the chloride of zinc, acting on the ordinary alcohol and carbonizing the coloring matter, develops an empyreumatic product which ought to be avoided from the beginning, otherwise thus taking birth, and accompanying the amylene, it cannot be separated from it subsequently.

M. Hepp has recommended, following the process of M. Cahours, to agitate the potato-oil with water in order to remove the alcohol; bnt if this process has succeeded in the hands of onr learned *confrère*, it mnst be owing to the fact of his being in possession of almost pure amylic alcohols; for, if like ourself, he had had the misfortnne to get hold of none bnt highly alcoholic potato-oils, he would, like us, have found that the washings, while carrying away the ordinary alcohol, would likewise carry away the fonrth, the half and even the wholé of the potato-oil. The water separates the alcohol, it is trne, but the latter acquires immediately a great solvent power over the potato-oil. Before submitting it to washing, we should, in all cases, look to the quality of the the amylic alcohol, and in view to this we here submit the parallel of character which we have observed between the pure and impure amylic alcohols:

QUALITIES OF PURE AMYLIC ALCOHOL.

Potato oil is a colorless, limpid liquid, of an oily appearance, of a strong odor; agreeable in its first impression, bnt afterwards nauseabund in a high degree. When its vapor is respired, asthmatic symptoms occnr, which produce cough, and even vomitings. Its taste is very acid. It is inflammable, and burns with a whitish blue flame. It boils at 132°, and its sp. gr. is 0.812.

At 19° or 20° it solidifies, forming crystaline scales. It stains paper, the stains disappearing some time after. It is sparingly soluble in water, to which it imparts its odor. It mixes in all proportions with alcohol, and ether and the fatty and the essential oils, etc. (Liebig).

We may add that in agitating this pure oil with water in a wide tube, it arises again to the top, and occupies the same space in the tube that it occnpied at first. In the experiment, the potato oil ought to retain its transparency, and the water itself ought to remain limpid. When an iron blade, moistened with it, is brought near the flame of a bougie, the metal, receiving a

QUALITIES OF IMPURE AMYLIC ALCOHOL.

The crude potato oil is more fluid and less oily; its order is more alcoholic and stronger, being ordinarily colored, and more inflammable than the pnre oil. When it contains only one-tenth of ordinary alcohol, and an iron plate is moistened with it, it burns when brought into contact with the flame of a bougie. The oil of potato is very combustible; but it will not take fire under snch condition, from the fact that its volatilization and combustion demand a higher degree of heat than can be imparted to it in *an instant* on the conducting metal.

Pouring a little of this product in a glass tube containing water, and reversing the tube, after having corked it, the crude oil changes the water, in traversing it becomes opalescent, and communicates to it a milky appearance; and if the experiment be condncted in a graduated tube, and the mixture be strongly agitated, after repose it will be observed that the snperincumbent oil is diminished in quantity, correspondingly with the amount of alcohol which has been dissolved.

part of the heat, leaves no trace of the amylic alcohol. In order to inflame, under these circumstances, the potato oil must be at 39° to 40° of the aërometer. This test is of value only in the absence of ordinary alcohol.

When it contains alcohol, the latter is naturally accompanied with water; but the mixture is rapidly warmed, when a salt which has a strong attraction for water is introduced, as the dry chlorides of zinc and calcium.

PURIFICATION OF POTATO OIL.

We must look to the method which possesses the greatest efficacy, and which is at the same time the least expensive. After various trials, the method of purification which has been attended with the best success in our hands, is the following: I pour the amylic alcohol in the cucurbit of an alembic, and adding four or five times its volume of water, I agitate the mixture, and luting the apparatus, I distill with a very moderate heat. At first, the resulting product is a limpid and homogeneous product, odor strongly alcoholic, and miscible with water without turbidity. Up to this the product appears to be ordinary alcohol, but soon the distillation slackens, and then the first product must be removed, and the recipient must be changed. At this second step, the distilled liquor is milky, which is a mixture of ordinary alcohol, amylic alcohol, and water; then comes the amylic alcohol almost pure, accompanied with water only; and finally, the distillation is to be arrested, when it is found that nothing passes over but an aqueous product. The second recipient contains the amylic alcohol, which is to be separated by means of a syphon. In this state it still contains a little ordinary alcohol, so great is the affinity of the two liquids for each other. The product may now be washed without much loss; but this washing not having all the desired efficacy, unless frequently repeated, I have recourse to a second means, which has been perfectly successful, not with a view of removing the water as has been recommended, but with a view of radically separating the alcohol. I rectify on a great quantity of dry chloride of calcium, this salt having the effect of dehydrating and concentrating ordinary alcohol, and by these means giving it the property of volatilizing at a low temperature, and by this means also the alcohol passes immediately by distillation. After this, there is a marked arrest of distillation, though the heat continue the same, and the recipient is to be replaced by another vessel destined to receive the potato oil, which, by increasing the heat, is now wholly distilled over in the desired purity.

PREPARATION OF AMYLENE.

Whilst physiologists are conducting experiments with a view of studying the effects of amylene on man and animals, an uncertainty rests on the whole, from the fact that all the products employed under the name of amylene, are only multiple compounds of several carburets, and I shall hereafter show that these amylenes contain besides, sometimes ether, but up to the present time, *always amylic alcohol.* Now the main question is to determine, if we can, as an industrial process, succeed in the manufacture of amylene properly so called. If the difficulty of obtaining pure amylene, should so augment the price as to render its surgical employment impracticable, and if, at the same time, it is, nevertheless, found that a mixture of amylene, paramylene, metamylene, etc., possesses a real value, useful properties, and, in fine, is worthy of being adopted as an anæsthetic, we ought, at once, to determine the precise character of the article to be used—the quantity of absolute amylene which this compound of the hydro-carburets ought to contain. Thus we ought to determine the highest boiling point, and never to use a product leaving a residuum, on distillation, beyond this *maximum* of heat. We should seek the means of recognizing its bad qualities, and of showing its adulterations. But most specially should pharmaceutists and chemists bestir themselves with a view of furnishing a good preparation at the lowest possible price.

Apparatus.—The material composing the apparatus is a subject worthy of consideration. Glass retorts are generally used when active reagents are required; and in this view the chloride of zinc would appear to demand their employment, there being no chemical action thereby produced on the glass, and its transparency permitting ready observation. Amylene, up to the present time, has generally been prepared by means of glass vessels. I myself used them in my first trials, but I soon realized their insufficiency and inconvenience. They are not adapted to an extensive production of amylene; they require a great deal of combustible material, and from their fragility, they expose the manipulator to the occurrence of serious accidents. A distillation from glass is tedious and difficult, even when we take the greatest care to cover the arch of the retort in the most careful manner in the sand-bath, in order to retain the heat. If amylene were produced at a low temperature, and if it passed *alone* into the receiver in distillation, these inconveniencies would not exist; but as it comes over at first with its congeners, paramylene and metamylene, these heavy vapors when at the summit of the retort, give out their latent heat, and they become condensed, and, for the most part, descend again. Meanwhile the chloride of zinc becomes concentrated, abandons a part of its water, and becomes more and more active, and it then carbonizes a part of the amylic alcohol and of the hydro-carburets, and at the same time this radical alteration imparts to the amylene a strong empyreumatic odor. I therefore now make use of a copper alembic, this metal not being acted on by the chloride of zinc. In this apparatus, which is indeed required in every laboratory, the process is conducted, at a less expense, and by its use we make a considerable step towards the reduction of the price of amylene.

PRELIMINARY EXPERIMENTS.

The action of the Chloride of Zinc, at different degrees of temperature, on Amylic Alcohol.—I. When potato-oil is agitated with the chloride of zinc coarsely broken, the mixture becomes a little heated, and on reposing, the saturated oil being separated from the excess of the salt, and mixed with a certain proportion of water, in order to remove the chloride, there will be found after the evaporation of this water, a residuum of the chloride of zinc, of one tenth of the weight of the oil which has been withdrawn. Thus a gramme of the concrete chloride of zinc dissolves in ten grammes of the potato-oil.

II.—A particle of the oil which has remained on a particle of the chloride of zinc, is colored in a few minutes, and before the next day a great part of the oil is carbonized; and, therefore, in the concrete and *cold* state, this salt acts strongly on the potato-oil.

III.—When the oil is impregnated with only little fragments of the dry chloride of zinc, and left to reäct for an hour, and if then a little water be added, the latter uniting with the chloride will immediately produce sufficient heat to disengage light bubbles, the odor of which seems to approach very nearly to that of amylene.

IV.—An oily solution, saturated with the chloride of zinc, as in the first experiment, does not become carbonized. If we shall have made such solution several days previously, the elements of the oil will now be found to have become slowly modified and disposed to give out a greater quantity of amylene by distillation. I am informed that M. Hepp has also observed the same fact.

V.—After many days preparation, I have made the distillation without adding anything to the above saturated solution. I have obtained a product which was not pure amylic alcohol, nor was it amylene, or at least there was but very little of the latter present.

VI.—Seeing that the quantity of the chloride of zinc dissolved by the amylic alcohol was not sufficient to transform it into the hydrocarburets, I introduced into the cucurbit of a little copper alembic, placed in a sand-bath, dry chloride of zinc to the amount of about the one-sixth the weight of the amylic alcohol employed. I poured on this chloride a sufficient quantity of amylic alcohol to cover it, the alcohol having previously been saturated with the chloride, and the head of the alembic being well luted and connected by means of a caontchonc to another tnbe descending from a glass reservoir with a stop-cock, and which contained the remainder of the amylic alcohol. On the other side, I pnt a receiver of the same dimensions with the reservoir and gradnated in the same manner. Moreover, certain special precautions were observed, and every thing was disposed as in M. Scottman's apparatns for the production of ether. The refrigerator was filled with ice, and the distillation was carried on by means of a slow fire.

The operation soon began, and proportionally as the liquid ascended into the receiver, I cansed the fluid in the reservoir to descend into the cucurbits. The distillation went on with great rapidity, and I snspended it in a short time after exhausting the reservoir. The product separated from the water and rectified in a glass retort by means of a water-bath, was by no means pure amylene; bnt it was abnndant. It possessed a somewhat stronger odor than that which I had procured by means of the concentrated chloride. It is very nearly identical with the amylene of Dr. Snow. In varying the proportions and the state of concentration of the chloride, I hoped that this apparatus wonld prodnce good results.

VII.—In this experiment I have followed the process of M. Hepp, which consists in mixing in a retort equal parts of amylic alcohol and the chloride of zinc at 70 degrees of the aëromcter of Banmé, agitating the distilled product with an equal volnme of sulphuric acid, separating the acid, and then rectifying by means of the water-bath. The boiling of this amylene commenced at + 31° and was carried to + 64°.

VIII.—The experiment similar to the preceding, with the exclusion of sulphnric acid: The prodnct being simply rectified by means of the water-bath at the temperatnre of + 60°, and agitated for a long time with one-eighth of its weight of dry chloride of zinc, and again distilled, an amylene resulted, the ebullition of which commenced at + 30°, and required at the end + 50°. The chloride of zinc is to be preferred, because it does not develop, like snlphnric acid, a disagreeable odor.

IX.—Dissolving in water the chloride of zinc, still impregnated with the amylene of the eighth experiment, an oily liquor came to the snrface of this soln tion. This oil, heated in a water-bath to 100° for an honr, was not volatilized. Testing it with potash, valerianic acid was produced. *Thus amylene, rectified by the water-bath below* 60°, *retains a great deal of amylic alcohol;* but this experiment shows that the dry chloride of zinc has the property of removing this alcohol, without affecting the amylene.

These experiments go to show the difficulty, not to say impossibility of discovering a facile and inexpensive method of obtaining pure amylene. Let us examine the qualities of the amylenes in use: I have taken four different preparations, namely: 1, that of Dr. Snow (A); 2, that of M. Ménier (B); 3, that which I have prepared according to the process of M. Hepp (C); 4, the amylene obtained in the sixth experiment (D). The fixity of the boiling point, being one of the principal means of defining a liquid compound, I distilled in succession these four amylenes in a small retort provided with a thermometer. The following was the result:

Boiling of product	A	began at	+ 30°	and closed at	+ 60°
"	B	"	+ 29°	"	+ 75°
"	C	"	+ 30°	"	+ 62°
"	D	"	+ 31°	"	+ 57°

This variation in the degrees necessary to the ebullition of these products, indicates not only the presence of carburets more volatile than amylene; but, on the contrary, also the presence of bodies less volatile.

Action of Potassium on impure Amylene.—The amylenes having a badly defined character may be nothing other than a mixture of the different carburets, and of amylene, properly so called. In such case potassium would have no more action on them than it would have on the oil of naphtha, in which it is placed for preservation. But such is not found to be their condition, the potassium oxydating in these amylenes, and giving ont hydrogen gas in abundance. In order to determine the quantity given out, I have taken a little dry flask to which I adjusted a curved tube, passing it into a hydro-pneumatic receiver with a graduated scale, and I have placed successively in this flask, an equal weight of the aforesaid amylenes, with a large excess ef brilliant potassium cnt into small pieces. The disengagement of gas was rapid in each experiment:

3 grm.	of amylene	A,	in contact with potassium,	gave out	64	cubic	centimetres of	hyd. gas.
3 grm.	"	B,	"	"	91	"		"
3 grm.	"	C,	"	"	75	"		"
3 grm.	"	D,	"	"	69	"		"

The action of Potash on impure Amylene.—The oxydation of potassium, and the consequent disengagement of hydrogen, would indicate the presence of potato-oil, and perhaps a little ether derived from the alcoholic oil; but it is especially probable that this reäction takes place between the metal and the elements of the amylic alcohol, in which is found two equivalents of water. Moreover, there is potato-oil found in it by agitating with portions of potash, which is slightly humid, and there is here soon developed the odor of valerianic acid, rendered still more sensible by the addition of sulphnric acid.

PURIFICATION OF AMYLENE.

Knowing that the amylenes in actual use, are but mixtures of amylene, the isomeric carburets and amylic alcohol, and having proven by experiment the difficulties that are to be encountered in obtaining the absolute amylene (C^{10} H^{10}) of M. Balard, and desiring to obtain the *type of this product*, I continued my experiments on rectification. Already it had occurred to me that at a very low temperature, with the water—both amylic alcohol obstinately passes over with the amylenc, but that happily this alcohol can be separated by the chloride of zinc. I treated at several times impure amylene with this salt in its dry state, re-distilling many times, and I have thus obtained a liquid which is neutral in the presence of potassium. But by the test of the thermometer, I have still realized the inconstancy of the boiling point. These repeated rectifications had caused the loss of the very volatile elements which boil between + 29° and + 34°; and on the other hand the extreme of + 60° was reduced to + 45°. I then obtained a fluid which boiled between 34° and 45°. I thereupon, for the last time, put the fluid in the retort, and I collected *none save the part which distilled fixed at* + 35°. This time I procured the pure amylene of M. Balard—but at what price! I obtained forty grammes of amylene, (ten drachms) from five litres (tent pints) of amylic alcohol! We mnst surely hope better things on the score of economy.

To sum up the essential character of amylene is: 1, to boil at + 35° fixed; 2, to possess no action on potassium, and to preserve this metal like the oil of naphtha; 3, to receive no coloring from the presence of canstic potash, *even when prolonged;* 4, to give birth to no valerianic acid under the action of the hydrate of potash.

ART. VI.—*Embalment. Burial.*

WEST FELICIANA, LA., March 28th, 1857.

DR. DOWLER:—*Dear Sir*:—The circumstance of the body of Dr. Kane having been "embalmed after the method of Gannal," has raised the question in my mind as to what that method is? I am aware that it purports to be, the injection into the arteries of the acetate of alumine, formed by mixing solutions of the sulphate of alumina and potassa, and the acetate of lead, and throwing down the insoluble sulphate of lead, and forming the acetate of alumine, yet he admits that this preparation, in the course of time, causes the subject to take on "all the exterior aspect of the negro," owing to the lead still held in solution combining with the hydro-sulphuric acid disengaged by the decomposition of the body; in fact, this process seems only intended for the prescrvation of bodies for dissection, as he acknowledges in more than one place, that he retains the secret of embalming for his own special use and benefit. As my copy of Gannal's work on the subject dates back to the year 1840, and only gives (or pretends to give) his researches up to 1838, and that in a very (to me) obscure manner, my information may be old; and for this reason, I am induced to ask whether or not his researches have been continued, according to promise, and if so, what is the result? In fine, what is the method of Gannal? and does any one really possess a knowledge of a method of preserving the bodies of the dead for any length of time in any climate, except those known to possess the property independently of any artificial process whatever? and if so, what is that method? An answer to these queries through the columns of the N. Orleans Med. and Surg. Journal would be particularly gratifying to me, and, no doubt, interesting to many of your readers. Respectfully yours, etc.,

W. T. COX, M. D.

——"Embalm me,
Then lay me forth."—SHAKS. Henry VIII.

——"Thy virtues are
The spices that embalm thee; thou art far
More richly laid, and shalt more long remain
Still mummified within the hearts of men
Than if to lift thee in the rolls of fame
Each marble spoke thy shape, all brass thy name."—HALL.

THE *Gazette Médicale de Paris*, No. 46, *anno* 1851, contains a report on the substances used in embalming the dead. This report is an official one made by a commission appointed by the Academy of Medicine, and is an answer to the request made by the Minister of Agriculture and Commerce; the latter having consulted the academy agreeably to the advice of the council of health, in regard to the interdiction of embalming with poisonous substances. The commission consisting of MM. Orfila, Bussy, Chevallier, Poiseuille, and the reporter, M. Caventou. The result of their deliberations may be summed up in the following condensed translation: The recognized agents, adapted to the preservation of animal bodies, as proven by numerous experiments, are partly derived from the mineral kingdom; such are certain alkaline and earthy salts, as the chlorides of potassium or sodium, the sulphate of soda, the nitrate of potass, the aluminous salts, etc., but all such are quite limited in their preservative powers, unless associated with arsenic. The use of the metalic salts, such as those of zinc, mercury, lead, copper or iron, is, to a certain extent, poisonous. Arsenical preparations have been already proscribed by a law passed October 29, 1846, since which, corrosive sublimate has been much used; also the acetate of lead and the salts of copper. The dangers incidental to the employment of these poisons, ought, as the commission think, to exclude them from use in embalming the dead.

M. Bussy thought the report too absolute in maintaining that no substance devoid of arsenic can be relied on. M. Gannal affirmed the contrary, and M. Chevallier, who had examined a great number of preparations made and intended for embalming the dead, found that they contained no arsenic. M. Bussy thought that the salts of alumina which are convenient and useful for embalment should not be interdicted.

M. Caventou denied the efficacy of aluminous salts in embalming, unless the body be buried in the earth. M. Bussy, however, said that he would not oppose the adoption of the report.

M. Orfila said he had examined M. Ganual's preservative preparations, which he found not *lightly* but *very strongly charged* with arsenic. After having examined M. Ganual's first preparation for embalming, M. G. directed the commission to a second kind which contained no arsenic, but which did not preserve the body from running into horrible rottenness: "*Les cadavres injectés avec ce liquide furent trouvés, au bout de quelque temps, horriblement pourris.*" M. Orfila denied the efficacy of aluminous salts for the purpose of embalming the dead.

The Academy adopted the conclusions of the report, (Nov. 11, 1851.)

Some time subsequeutly to this report of the Academy, the following statement concerning M. Gannal's reputed discovery appeared in the public journals :

" *Verification of an Interesting Discovery.*—Dr. Quesneville, the editor of the *Revue Scientifique* of Paris, in a late number of that journal, gives an account of some experiments, at which he was present, to test the merits of a new discovery in the art of embalming. 'Agreeably to the invitation,' he says, 'which was addressed to us in common with a large number of physicians and journalists, we were present at the exhumation of a body that had been embalmed after the method of Gannal. This took place in the cemetery of Père La Chaise, and we were attracted by no ordinary feeling of mere curiosity. A recent report of the Academy of Medicine had called in question the reality of this discovery, supposed indisputably established. A public defiance had been thus given to this celebrated embalmer, who was not slow in taking up the glove thus thrown to him. We found on the spot, a large concourse of curious spectators; but the family would not consent to admit more than six physicians out of more than 150, who came to ascertain the result of this curious exhumation. The body in question, embalmed in 1844, was found in a perfect state of preservation. Thus have failed, therefore, these inexplicable efforts of this learned body, after so short a time, to destroy the reputation of a discovery extolled by their own published testimony.' "

Embalming, which is very rarely practised in the United States, is deemed of great concernment in some European countries.

" *Embalming in France.*—It is a singular fact," says the London *Lancet*, " bnt nevertheless true, that in France, at the present time, (1844) the higher and richer classes are nearly as much in the habit of embalming their departed relations as were the Egyptians, or the inhabitants of the Canary Islands, in the days of old. The principal difference, however, between the men of former times and our continental neighbors is, that the former embalmed their dead in such a manner as to render them nearly imperishable, as our museums can testify, under the impression that the soul remained near the body as long as it retained its terestrial form; whilst the latter, who are not much troubled with superstition, as every one knows, are content to impart to their dead a temporary immunity from decay."

G. R. Gliddon, Esq., formerly U.S. Consul at Cairo, an able Egyptologist, long a resident in Egypt, having left me for perusal, a MS. of his on Mummies, I have extracted from it the following abridged statements of facts and opinions: "The soil of Egypt is so profoundly drenched by inundation, that from the earliest to the latest times, no cemeteries were constructed on the alluvial plain. The dead were interred upon the *sand* at a level high above the water-line of the river's utmost rise, where they rapidly *dried.* The towns were situated some miles off from the *Necropoles.* The dead were carried to the desert, which in some cases lay ten to fifteen miles off, and which was used as the primitive burial places before the art of mummification was introduced—before pyramids and catacombs were constructed.

"In summer the plague does not occur along the Nile—it is a winter and spring disease that dies invariably in *June.* But the peculiar atmospheric phenomena of Egypt are then, such, that as the heat is greatest so the N. W. or Etesian blows highest. In fact, what with the N. W. wind blowing up the river eight months of the year, and the S. E. blowing four months down, the valley of the Nile is a perfect *air funnel* through which for six months out of the twelve the wind blows a gale upwards or downwards.

"We return to the earliest days of Nilotic ante-monumental history when the primitive wandering shepherd transformed by time and necessity into a stationary farmer, had witnessed the drying effects of the sands of the desert, impregnated with *Natron,* which preserved the dead from putrefaction; he was led to use this and *baking* or *desiccation,* bitumen, bandages, clothes, etc., and to excavate rocks and make tombs for his dead.

"Mummification ceased about A. D. 640. The Necropoles of Memphis covers about twenty-two miles from N. to S. and about a mile in breadth from E. to W., being the most ancient extant.

"The largest Necropoles of the Nile are to be found on the *Western* side along the Lybian chain of limestone hills, in the neighborhood of the larger cities. Sau̇àra, the nearest to Memphis, is the largest.

From the remote age of *Menes*, (whose reign cannot be brought down later than 3600 B. C., probably 5000 B. C.,) the city of Memphis continued to pour out her dead upon this vast emporium of bodies, down to from 500 to 800 A. D.

"Great inconvenience is experienced, now-adays, in Egypt, owing to the heat and rapid putrefaction of *corpses* which are in consequence hurried to the grave with a celerity quite appalling to our European ideas. In the plague of 1835, I spoke with a Nubian servant who was apparently in good health about 12, M., and by 2 o'clock his bier passed my house with the lugubrious chant announcing his body's last journey to the dust. Cases such as these are familiar to all in oriental countries. At Cairo I have frequently had occasion to pay the last obsequies to friends whose relations wished the *corpse* to be sent to the Protestant burial ground at Alexandria, to England, and even to America, and with the utmost expedition, and at lavish expense, in copper or leaden coffins, it was scarcely possible to place the corpse into them quickly enough to escape inconveniences: for without *ice* it is impossible.

"The invention of mummification obviated all difficulties: the bodies went instantly to the embalmers as soon as the breath had abandoned them; every provincial temple had its complete establishment for converting them into mummies at any expense the family chose, and after about seventy days the corpses were ready to be conveyed any distance to the tombs."

Although the period of seventy days here given agrees with classical history, (Herodotus and others) yet the Pentateuchal history proves that Jacob's body which was embalmed in Egypt, agreeably to the method then in use in that country, required but forty days to "fulfil" the whole term "of those who are embalmed:" "And Joseph commanded his servants, the physicians, to embalm his father: and the physicians embalmed Israel. And *forty days* were fulfilled for him; for so are fulfilled the days of those which are embalmed."—*Gen. L.*, 2, 3.

Embalment among the Hebrews at a later æra is thus briefly indicated in sacred history: "And there came also Nicodemus (which at the first came to Jesus by night) and brought a mixture of myrrh and aloes, about an hundred pound weight. Then took they the body of Jesus, and wound it in linen clothes with the spices, as the manner of the Jews is to bury."—*St. John* xix, 39, 40.

Mr. Gliddon estimates that the Necropoles of Memphis and Thebes held half of the dead of ancient Egypt below the first cataract, and that in 3,000 years, during which mummification prevailed, the number of mummies amounted to four hundred and fifty or five hundred millions, "all being imperishable save by the hand of *man*."

"The average length of mummies, owing partly to the desiccation each body has undergone, which has contracted its true proportions, and partly to the fact that the ancient Egyptians were not a large race of men, may be roughly estimated at five and a half feet, when enveloped in their wrappers. The height of the reclining body and the breadth across the shoulders one and a half feet each.

"Extraordinary as my assertion may seem, the tombs of Egypt excavated in the rock, are numerous enough to hold all these mummies.

"In chronological duration, *mummification* antedates all human history, all monumental records, and following its phases down to the fifth centnry after our era, a period exceeding five thousand years!"

In a published work, (*Otia Ægyptiäca*) Mr. Gliddon gives the prices of Egyptian embalments: "Three classes of mummies; the first of which costs one thousand two hundred and fifty dollars, the second, three hundred dollars, and the third, or cheapest, twenty dollars; some having one thousand yards of *linen* weighing forty-six pounds, varying in texture from good calico to superfine cambric.

"The Egyptians were under our average size. The length of life in Egypt, even in days long before Abraham, being the same as our own, proved by innumerable sepulchral tablets, the reigns of kings, and the skulls of mummies."

The Pharaonic embalmers and their successors and imitators, down to M. Gannal, stand at an almost infinite distance below the late celebrated Italian, Segato, who possessed the art of fossilizing or petrifying the human body, not excepting its softest tissues, as the viscera, brain, etc. There is, as reliable travelers assert, a table in the museum of Florence, made in mosaic out of the human organs, solid like marble, the pieces of which were prepared by Segato. He carried his secret with him to the tomb.

The reader is referred to an article in this Journal, translated by Dr. M. M. Dowler from the *Jour. de Méd. de Bourdeaux*, (July, 1856) in which will be found Prof. Barbet's account of the method by which M. Lapeyrouse mineralizes animal matters by the earthy chlorides in twenty or thirty hours, so that animal substances will remain unchanged for "an unlimited time." This process, M. Lapeyrouse has patented. His experiments were made before the commission of the Council of Hygiene of Gironde, and should future experience and the test of time confirm all that Prof. Barbet of Bordeaux has said in its favor, the discovery will not only supersede all other methods of embalming the dead and of preparing anatomical subjects for dissection or preservation, but must prove highly advantageous in an industrial and economical point of view, and the more so, because it is not attended with much expense.

The value of this discovery, if discovery it be, cannot be definitely proven, except by the test of time. This test is in favor of the Egyptians as yet, seeing that without having used poisons dangerous to the living, they have preserved the dead for thousands of years. MM. Gannal, Lapeyrouse and others, must perfect their methods by excluding deadly poisons, and by awaiting the lapse of the forty centnries which Napoleen I saw perched upon the pyramids, looking down on the army at the battle of the pyramids!

Baron Larrey, the great surgeon, in his Military Memoirs of the campaigns in Egypt, gives a very interesting account of the Egyptian mode of embalming, yet he claims, nevertheless, for the moderns, the highest degree of success in this behalf, giving at the same time his mode, which consists chiefly in the application of corrosive sublimate to the fleshy parts, and then the plunging the whole body in a solution of this dangerous poison for ninety or a hundred days. "Thus," says he, "I preserved the body of Col. Morlan, who fell at the battle of Austerlitz; it is still perfect." But it is poisoned! To prepare, to dissect, or to keep such a subject is not devoid of danger. Should any evil minded person wish to poison his neighbor, a bit of the gallant colonel might be used. Besides, religion or affection, which gives rise to the embalment of the dead, must abhor the association of the idea of a beloved friend with a deadly poison!

The following paper from the *Charleston Medical Journal* translated from the *Moniteur des Hôpitaux*, presents a brief historical summary of the art of embalming :

We must go back to the earliest ages, in order to find the origin of preserving bodies, but for its history we must confine ourselves to those traditions which have been handed down to us in connection with the discovery of monuments which have escaped the destructive effects of time. Among the nations of Asia and Africa, where embalming appears to have been a general custom, those holding the first position were the Egyptians and the inhabitants of India. The Egyptians particnlarly, who left such numerous traces of ancient splendor, seemed to have wished to perpetuate themselves even in death, in strewing upon their soil mummies as indestructible as the superb monuments which concealed them.

Historians and antiquarians still conjecture on the motive which led these people to preserve the dead with so much care. Some attribute it to the belief that the soul, after escaping from the body, wandered about during 3000 years to reënter it, and that, therefore, the destruction of the former would compel it to pass into the body of an animal. The more rational believe the practice to have arisen in connection with the principles of hygiene, one of the branches of medicine that the Egyptians cultivated with so much success. For in these hot regions, only receiving fertility from the overflowing of the Nile, the decomposition of bodies deposited in the earth would soon destroy the purity of the air, and spread among the population the seed of the most virulent disease. It is true that the places destined for burial were above the inundations of the river, but in these elevated places the putrefaction of bodies would have been even more fatal; for the winds which prevail in these countries in bringing putrid miasms from a distance would have transported also their disastrous effects. These considerations were too intimately connected with the interests of the public health to escape the enlightened spirit of those who had it under care; thus, Herodotus relates, that during a period of three thousand years Egypt was one of the healthiest countries in the world. Now, subject to the fatal yoke of Mahometanism, it no longer enjoys this immunity, but it has become the hot-bed of the plague. The various modes of embalming in Egypt might be reduced to the following operations:

1st. Remove from the body all fatty matters and mucous portions, by the prolonged action of soda.

2d. After having well washed the body, dry it in the air or in a stove.

3d. Preserve it by employing bitumen, balsams, resins and salts.

4th. Surrounding it with numerous strips of cloth, smeared with gum or bitumen.

The aromatics employed by the rich, were myrrh, aloes, cannella and cassia. For the inferior classes, cedar and the bitumen of Judea.

The duration of embalming varied from forty to seventy days, depending much on the drying of the bodies. When the operation was finished, they were enclosed in sarcophagi, and deposited in sepulchral chambers, inaccessible to moisture, the temperature being maintained at about 88 degrees, Fahr.

It is under these favorable conditions that a great number of mummies have been preserved through a long series of ages, and now supply us with sufficiently accurate knowledge of the art of embalming among the ancient Egyptians.

The Indian mummies, exhibited at the Garden of Plants, appear to have undergone an analogous preparation to those of Egypt. After embalming, the bodies were sewed up in the skin of goats, and deposited in catacombs.

In examining carefully the tissues of mummies, an analysis will detect nitrate or carbonate of potash, or sometimes sulphate and chloride of soda, or the iodides of lime and magnesia. During the infancy of the art, drying and aromatic substances were alone employed; later, saline matters entered among the ingredients. Ethiopians, inhabiting a country richer in gum than the rest of the globe, were accustomed to inclose their bodies in a molten mass of this transparent matter, while the Scythians and Persians covered them with an envelope of wax.

Pliny speaks of the antiseptic properties of honey, and it is related that Alexander the Great, after death, was rubbed with honey before burial.

Modern nations following the example of the ancient Egyptians have long practised evisceration in connection with the use of a number of solid and fluid substances to preserve bodies. Alcohol, essential oils, and compound liniments are most conspicuous; balsamic and aromatic powders with saline substances are also used.

In the middle ages the art of embalming consisted in mixing aromatic substances with salt, with which the bodies were filled. Henry I of England was thus embalmed in 1135: long incisions were made in various parts of the body, filled with this composition, then sewed up, the body being then enveloped in a beef's skin and enclosed in a coffin. The employment of salt for the preservation of the bodies of kings, is well known in history, the sellers of salt claiming as their right to assist at the royal funerals, and bear the bodies of the kings.

In 1658, Louis C. Bils, a noble of Holland, well skilled in anatomy, announced that he had found a way of preserving bodies from putrefaction without evisceration, so that the form and flexibility of the extremities being retained they could be used for dissection. The announcement of this discovery on the part of the first noble who had given up himself to the pursuit of anatomy made a great sensation. At the height of his renown the States of Brabant bought from him five embalmed subjects for 22,000 florins. Zipœus, professor of anatomy at the University of Lonvain, to whom they were given, was appointed to receive the secret; but a few weeks had hardly elapsed when the bodies became putrid. Bils, pretending that such a result was owing to the jealousy of the professors who placed his preparations in a damp situation, in order to promote decomposition. Bils' treatment of bodies was with himself eminently successful; the secret was buried with him.

Ruysch, also a Dutch physician and anatomist of celebrity, tried to eclipse his adversary, Bils. He succeeded in injecting pieces, which preserved their softness, flexibility and color. His collection so attracted general attention that it was visited by all the curious of Europe. It is said that Peter the Great during a visit to this museum, was so attracted by the embalmed body of a little child, which appeared to invite him with a smile, that he kissed it. Ruysch sold his collection, at the entreaties of Peter the Great, for 30,000 florins. Although seventy-nine years old, he immediately recommenced forming a collection, which he succeeded in doing in two years. In dying, in 1731, he also carried off with him the secret of his admirable injections.

Darconville was the first who discovered, in 1762, the preservative properties of corrosive sublimate, but we are indebted to the illustrious Chaussier for the practical use of this drug in preserving animal matter. Beclard, chief of the anatomical works of the faculty of medicine of Paris, applied the sublimate in embalming bodies. Charged with preserving the body of a young man who died with hectic fever, (the parents refusing to have the body opened,) after making numerous punctures and incisions in every portion of the body, he placed it in a solution of corrosive sublimate, in which it was kept for two months. When taken out, it was dried for a few days, and then enclosed in a glass case, where it remained for a year without smell, or the slightest appearance of alteration. It was then given to the family. The skin was discolored grayish, and the features were somewhat changed from the thinning of the lips, cheeks, eyelids and ears.

Bugliaretti, an Italian physician, united arsenic with sublimate. He injected with this solution the primitive carotid artery, the right jugular vein, the external iliac on both sides, and by using a trocar, he forced the fluid into the thorax and abdomen. The results obtained, appeared to be very similar to the preceding.

Dr. Tranchina, of Naples, acquired a great reputation in Italy for preserving bodies. His method consisted in an injection of a solution composed of 4 lbs. of arsenic in 10 lbs. of water. This mode of preservation, very dangerous for dissectors, did not serve the purpose of embalming, for the body became livid and atrophied in drying, till only a skeleton remained, covered with skin from which the cuticle had peeled.

In 1822, M. Gannal, manufacturer of glue, discovered that a solution of salt and alum would prevent fermentation. With this mixture in connection with a small quantity of arsenite of soda, he injected the body of a child, which was left on the tables of the Morgue for three months, and from which he attained a great reputation.

It is nearly fifty years since chloride of zinc was first used in England for preserving animal matters. Sucquet took out a patent for preserving pieces, by first injecting them with sulphate of soda, and then plunging them in a solution of chloride of zinc.

M. Granger had been previously acquainted with the antiseptic properties of the sulphate of zinc, and a young savant, M. Gratiolet, conservator of comparative anatomy at the Garden of Plants, had tried it for preserving anatomical pieces. After numerous experiments he abandoned this salt, which did not preserve sufficiently, as the tissues became discolored. The skin resembled parchment, and the muscles diminished more than a third of their volume. Although injections of this salt tried at the anatomical rooms in Paris were unsuccessful, it is still used by anatomists in preserving subjects.

Dr. Roux, of Nimes, teaches the following system: It is impossible to find an antiseptic, which will preserve all subjects. The following circumstances should be taken into consideration: 1st. The constitution of the subject. 2d. The cause of death. 3d. The temperature. Anatomists must have daily observed in the dissecting room, that putrefaction is differently produced: in some subjects it shows itself with extreme rapidity, in others, some days elapse, and a few might be kept for even weeks, without much decomposition. From this fact, he concludes that the choice of an antiseptic agent depends upon the character of the substance which it is intended to preserve—that is to say, upon each subject—should be chemically treated according to the constitution, cause of death, and influence of temperature. After long experience, this anatomist lays down the following rules:

A young animal is best preserved by using a sulphate; a sulphite for an animal at puberty; and a chloride for an adult; and lastly, to prevent mould from appearing on the surfaces pour over them either some essential oil, ether, or chloroform. There is no universal antiseptic agent. By following these rules, astonishing results will be obtained.

Preservation of Human Bodies.—No people have succeeded so well as the ancient Egyptians in preserving the bodies of their friends and relatives from decomposition. We have been at the vast Necropolis of Sakkara, and watched the process of dragging up the mummies from the deep pits in which they had rested for at least three thousand if not four thousand years. The restless Bedouin Arabs have been carrying on the revolting occupation of rifling those deep, capacious vaults in which many hundred bodies were artistically packed, several centuries, for the sake of the jewelry, shoes, caps and specimens of ancient arts that are thus brought to light; and although the business is still actively pursued, it is hadly probable that there will be any apparent diminution of mummies a thousand years hence.

This merely demonstrates the denseness of the Nilotic population through a long series of Pharaonic ages, but also the universal custom of embalming all the dead. Indeed, the same care bestowed in the mummification of human beings in Egypt, whether from religious or hygienic views, was also extended to dogs, cats, birds, crocodiles, etc., so that countless millions will not over-express the number still remaining in the most perfect state of preservation, a proof of all that might be collected on this curious and interesting subject.

A strong desire was evinced both in France and England, to prevent the decay of their early sovereigns, but their efforts, based upon no scientific principles, were very imperfect, so that it was quite rare to find a well-preserved body in any of the royal vaults in Europe. Generally they are in deep, damp places, under floors, or beneath low, massive arches, where no rays of sun-light ever appear, to dissipate the sweating moisture that corrupts whatever is placed within the gloomy resting-places of kings and potentates.

The royal vaults in which the whole line of electors, emperors, empresses and the families of the rulers of the Austrian empire are placed for the sleep of death, are dry, tolerably light and admirably ventilated. What the condition of the bodies may be in their costly sarcophagic and metallic coffins is of course unknown, as no mention is extant of any explorations for ascertaining.

The sarcophagus in which the august remains of Maria Theresa were laid—which was constructed under her own eyes, at an enormous cost, is a massive metallic structure occupying as much space on the floor as a large-sized bedstead. It is about five feet high, having magnificent metallic statuary at the corners, with curiously draped and winged figures as accompaniments. The Duke of Reichstadt, the son of Napoleon le Grand, is in a plain, unadorned metallic coffin, resting on a stool at the side of the wall. It has a dull metallic appearance, like tarnished iron. Possibly it may be zinc.

The Empress Louisa Maria, the second wife of Napoleon, the mother of Reichstadt, who died reigning Duchess of Parma, is in a similar looking coffin, placed in a like position, a few feet from her son.

But of all the modern final reposing places of royalty we have personally examined, those of the Sultans of Turkey are the most gorgeous and extraordinary in all respects. It would require a more severe examination of packed-away manuscripts, written over the mouldering remains of those ferocious monsters,—from Mahomet the Second to Mahomoud the Second, the father of the present Pedisha, Abdel Mejid, than we care to undertake, for particulars, and thus we close these hasty observations by showing the condition of some of the kings of England during eventful historical periods.

The English evidently desired to so protect the bodies of their early and later kings that they should resist the chemical tendency to decomposition. They partially succeeded in a few instances, only, as will be noticed in the following collection of facts.

King Edward I. died in July, 1307, and notwithstanding his injunctions, was buried in Westminster Abbey in October of the same year. It is recorded that he was embalmed, and orders for renewing the cerecloth about his body were issued in the reigns of Edward III. and Henry IV. The tomb of this monarch was opened, and his body examined in January, 1774, under the direction of Sir Joseph Ayloffe, after it had been buried four hundred and sixty-seven years. The following account is extracted from a contemporaneous volume of the Gentleman's Magazine:

"Some gentlemen of the Society of Antiquarians, being desirous to see how far the actual state of Edward First's body answered to the methods taken to preserve it, obtained leave to open the large stone sarcophagus, in which it is known to have been deposited, on the north side of Edward the Confessor's chapel. This was accordingly done on the morning of January 2, 1774, when in a coffin of yellow stone they found the royal body in perfect preservation, inclosed in two wrappers; one of them was of gold tissue, strongly waxed, and fresh, the other and outermost considerably decayed. The corpse was habited in a rich mantle of purple, paned with white, and adorned with ornaments of gilt metal, studed with red and blue stones and pearls. Two similar ornaments lay on the hands. The mantle was fastened on the right shoulder by a magnificent *fibula* of the same metal, with the same stones and pearls. His face had over it a silken covering, so fine, and so closely fitted to it, as to preserve the features entire. Round his temples was a gilt cornet of fleurs de lys. In his hands, which were also entire, were two sceptres of gilt metal; that in the right surmounted by a cross fleure, that in the left by three clusters of oak leaves, and a dove on a globe; this sceptre was about five feet long. The feet were enveloped in the mantle and other coverings, but sound, and the toes distinct. The whole length of the corpse was five feet two inches."

Edward I. died at Burgh-upon-Sands, in Cumberland, on his way to Scotland, July 7, 1307, in the sixty-eighth year of his age.

Another instance of partial preservation, is that of the body of King Charles I , who was beheaded by his subjects in 1649. The remains of this unfortunate monarch are known to have been carried to Windsor, and there interred by his friends without pomp, in a hasty and private manner. It is stated in Clarendon's History of the Rebellion, that when his son, Charles II., was desirous to remove and re-inter his corpse at Westminster Abbey, it could not by any search be found. In constructing a mausoleum at Windsor in 1813, under the direction of George IV., then Prince Regent, an accident led to the discovery of this royal body. The workmen, in forming a subterraneous passage under the choir of St. George's Chapel, accidentally made an aperture in the wall of the vault of King Henry VIII. On looking through this opening it was found to contain three coffins, instead of two, as had been supposed. Two of these were ascertained to be the coffins of Henry VIII. and one of his queens, Jane Seymour. The other was formally examined, after permission obtained, by Sir Henry Halford, in presence of several members of the royal family, and other persons of distinction. The account since published by Sir Henry, corroborates the one which had been given by Mr. Herbert, a groom of King Charles's bedchamber, and is published in Wood's Athenæ Oxoniensis.

"On removing the pall," (says the account,) "a plain leaden coffin presented itself to view, with no appearance of ever having been inclosed in wood, and bearing an inscription, 'King Charles, 1648,' in large, legible characters, on a scroll of lead encircling it. A square opening was then made in the upper part of the lid, of such dimensions as to admit a clear insight into its contents. These were, an internal wooden coffin, very much decayed, and the body carefully wrapped up in cere-cloth, into the folds of which a quantity of unctuous matter, mixed with resin, as it seemed, had been melted, so as to exclude, as effectually as possible, the external air. The coffin was completely full, and, from the tenacity of the cere-cloth, great difficulty was experienced in detaching it successfully from the parts which it enveloped. Wherever the unctuous matter had insinuated itself, the separation of the cere-cloth was easy; and where it came off, a correct impression of the features to which it had been applied, was observed. At length the whole face was disengaged from its covering. The complexion of the skin of it was dark and discolored. The forehead and temples had lost little or nothing of their muscular substance; the cartilage of the nose was gone; but the left eye, in the first moment of exposure, was open and full, though it vanished almost immediately; and the pointed beard, so characteristic of the period of the reign of King Charles, was perfect. The shape of the face was a long oval; many of the teeth remained; and the left ear, in consequence of the interposition of the unctuous matter between it and the cere-cloth, was found entire.

"It was difficult, at this moment, to withhold a declaration that, notwithstanding its disfigurement, the countenance did bear a strong resemblance to the coins, the busts, and especially to the picture of King Charles the First, by Vandyke, by which it had been made familiar to us. It is true that the minds of the spectators of this interesting sight were well prepared to receive this impression; but it is also certain that such a facility of belief had been occasioned by the simplicity and truth of Mr. Herbert's narrative, every part of which had been confirmed by the investigation, so far as it had advanced; and it will not be denied that the shape of the face, the forehead, the eyes, and the beard, are the most important features by which resemblance is determined.

"When the head had been entirely disengaged from the attachments which confined it, it was found to be loose, and without any difficulty was taken out and held up to view. The back part of the scalp was entirely perfect, and had a remarkably fresh appearance; the pores of the skin being most distinct, and the tendons and ligaments of the neck were of considerable substance and firmness. The hair was thick at the back part of the head, and in appearance nearly black. A portion of it, which has since been cleaned and dried, is of a beautiful dark brown color. That of the beard was a redder brown. On the back part of the head it was not more than an inch in length, and had probably been cut so short for the convenience of the executioner, or perhaps by the piety of friends soon after death, in order to furnish memorials of the unhappy king.

"On holding up the head, to examine the place of separation from the body, the muscles of the neck had evidently retracted themselves considerably; and the fourth cervical vertebra was found to be cut through its substance transversely, leaving the surfaces of the divided portions perfectly smooth and even, an appearance which could have been produced only by a heavy blow, inflicted with a very sharp instrument, and which furnished the last proof wanting to identify King Charles the First."

The foregoing are two of the most successful instances of posthumous preservation. The care taken in regard to some other distinguished personages has been less fortunate in its result. The coffin of Henry VIII. was inspected at the same time with that of Charles, and was found to contain nothing but the mere skeleton of that king. Some portions of beard remained on the chin, but there was nothing to discriminate the personage contained in it.

During the present century, the sarcophagus of King John has also been examined. It contained little else than a disorganized mass of earth. The principal substances found, were some half decayed bones, a few vestiges of cloth and leather, and a long, rusty piece of iron, apparently the remains of the sword-blade of that monarch.—*The Medical World.*

Revival of Urn-burial: by the Editor of the Edinburgh Medical Journal.—A curious discussion has been raised by the Académie de Médecine of Paris, on the mode of disposing of the dead. Several of the leading Paris journals, particularly the "Presse" and the "Siècle," defend with great boldness the assertion of the Académie, that the vicinity of Père la Chaise and the cemetery of Montmartre is gradually introducing new diseases amongst the working classes; and that in summer time, the hospitals are crowded with the victims of pestilence engendered by the foul air of the graveyards in the neighborhoods of Paris. The discussion is likely to lead to some result and to become a party question; for a new journal, to be devoted entirely to this one subject, has just appeared. This journal, called "La Crémation," is edited by two of the firit writers of the "Presse," and is supposed to be quite in accordance with the sentiments of the government. M. Alexandre Bonneau proposes to replace all cemeteries adjoining to all great cities by an edifice to be denominated a "sarcophagus." This edifice to occupy the highest spot of ground in the city, "where the corpses of both rich and poor should be conveyed, there to be laid out on a metallic tablet, which, sliding by an instantaneous movement into a concealed furnace, would cause the whole body to be consumed in the space of a few minutes." With true French instinct, M. Bonneau proceeds to urge not only the utility to the public, but also the interests of art in this new method of disposing of the dead, for he points ont with great complacency the new element of prosperity to the artists existing in the furnishing of funeral urns, which he declares would soon open a new source of expense and luxury to the rich. "For who would not love to preserve the ashes of his ancestor? The funeral urn would soon be found to replace on our consoles and mantel-pieces, the present ornaments of bronze clock and china vases now found there." All this may seem a misplaced pleasantry to English minds; but in Paris, these things find serious men to write and fight in their defense; and we cannot help feeling rather startled on reading the sanitary report which first led to their discussion. "The vicinity of the cemeteries is a constant source of mortality. No matter from what quarter the wind blows, it must bring over Paris the putrid emanations of Père la Chaise, of Montmartre, or Montparnasse; and the very water which we drink, being impregnated with the same poisonous matter, we become the prey of new and frightful diseases of the throat and lungs, to which thousands of both sexes fall victims in the spring and autumn of every year. Thus the *angine couenneuse*, which baffles the skill of all our most experienced medical men, and which carries off its victims in a few hours, is traced to the absorption of the vitiated air into the windpipe, and has been observed to rage with the greatest violence in those quarters situate on the outskirts of the town, and, consequently, the nearest to the cemeteries."

The latter argument has created many converts to the opinions of M. Alexander Bonneau; and the first number of "La Crémation" has excited much interest. After a long interval of deseutude, Sir Thomas Brown's "Urn-burial" may come to be consulted as a work for practical details—and the urns in our museums, instead of representing obsolete utensils, may become models for those vases which present such charms for M. Bonneau. Perhaps, however, the vase theory is a step too far in advance, and the Parisians, if they see their way to consumption by fire, may prefer burying the ashes of their friends in the earth, as was done with the remains of Shelley's burned body, rather than that the dust of humanity, however rich the enclosing caskets, should be chimney ornaments in drawing-rooms.

The utilitarian character of the English, as distinguished from the more fanciful temperament of the French, is exemplified in the mode of interment adopted in the case of the late Sir William Temple, as detailed in the "Times" some days ago. The body was interred in a bed of charcoal, whilst the gases from the coffin are conducted by a pipe to the outside of the church. The leading journal speaks in high terms of the conserving influence thus exercised on the lungs of worshippers; but we are not so sanguine as to the benefits of the system. It may do in rare instances of intra-mural burial, but if universally adopted, congregations would be saved at the expense of the general public. Cremation is a process to which the British mind will not soon be reconciled, and the only graveyard reform presently within reach is distant cemeteries and deep sepulture amongst charcoal or other deodorizing substances.—*Abs. Med. Sci. No.* 24.

Dr. Londe, member of the French Academy of Medicine, has contributed to the *Revue de Thérap. Méd. Chirurg.*, (Nov. and Dec., 1856,) several papers of interest upon the cemeteries of Paris in relation to the modes of interment, exhumations, hygienic influences, etc. Emanations from putrefying animal bodies, he avers, cause, when concentrated, vertigo, *malaise*, nausea, loss of appetite, fainting, asphyxia, and death. Hence, he argues against the former practice of burying saints and others under the alters of the churches—a practice, which, in 1744, a Huguenot professor of Montpellier was bold enough to oppose as not only inconvenient but dangerous to health.

In 1776 the government of France restricted the privilege of burial in the churches to a few of the higher orders of the clergy. In 1804 this practice was wholly interdicted, not only as to the churches but in regard to the densely inhabited or central districts of cities.

Interment in towns, in churchyards, within the walls and under the altars of churches, is attributable to christians rather than pagans. This pernicious practice, which originated in the fourth century of our æra, was directly at variance with the more salubrious method of disposing of the dead in ancient Greece and Rome, namely, cremation or burning, together with the interment of the ashes and burnt bones without the cities. The burning of the dead among the ancient Greeks was an almost invariable practice; even their monumental cenotaphs did not contain dead bodies at all. Among the Romans all the dead were not burned. Many were interred in the ground but always beyond the limits of the cities. The early christians, who were opposed to cremation, and who at first adopted the Hebrew method of burying in the earth, sometimes in vast excavations or caves, viewing the body as resting only for a time in the grave, in anticipation of "the resurrection and the life," from the best motives deposited their dead in the vicinity of churches, and finally in the churches themselves. This last honor was, however, restricted to personages illustrious for their piety or position. The genius of philanthropy guided by lights of science is now directed towards the correction of this insalubrious practice, and its total abandonment may be expected at no very remote period.

Of a Parisian cemetery, *Père la Chaise*, the author of "the American in Paris" (1839) says: "thirty years ago it had only fourteen tombs." Carter, in his letters, says "that this cemetery, made by Napoleon, was opened for the first burial, May 21, 1814, and that by the year 1825, it had received one hundred thousand dead. It contains seventy acres, being three miles from the centre of the city, upon the declivity of Mount St. Louis, having rocks, hills, vales, shade," etc.

The first named work gives a summary of the regulations for the inhumation of the dead in towns and cities: "All cemeteries are required to be located beyond or without the towns, avoiding low, wet, confined situations. The dead bodies are to be covered with at least four feet of earth, with four feet interval between each, and two feet at the head and foot, about fifty-two square feet for each corpse. The graves are disposed of in perpetuity, or in temporary cessions of six years; the former at twenty-five dollars per mètre of three feet, two mètres being required for a grave, and the latter at ten dollars; these being disposable anew at the end of the term, the first purchaser having the refusal. All the funerals are in the hands of a company, who have their office, keep a register of the dead, attend all wants, carriages, grave-diggers, weepers, etc. They have a fixed price for the rich, which enables them to bury the poor for nothing."

Dr. Londe says, that although the bodies are destroyed in two years, the grants, for greater security, in this behalf, now extend to the end of the fifth year. He says that in the cemetery Montparnasse, one hundred and twenty-two thousand have been interred within the last twenty years. In fifty years it will have received five hundred thousand dead bodies.

Interment in the *fosses* (graves) is the most usnal mode in Paris. Bodies buried in vanlts (*caveaux*) sometimes become desiccated or mummified, in positions favorable to the drying process. Examples of this kind of mummification have sometimes, thongh rarely, occurred in the vaults in New Orleans. In the Catholic cemetery, No. 2, as the sexton informed the writer in 1840, there had been a vault opened in the upper tier, where was fonnd the body of a man which had been long entombed, and which had never undergone putrefaction. It was dry, bnt otherwise little changed; the eyes, thongh desiccated, remained; the hair and whiskers, firmly set; the color of the skin, natural.

In dilapidated tombs, when the coffins had been placed on or near the gronnd, I found that the bones not yet wholly decomposed, might be crushed into a coarse powder by grasping them in the hand. The bones of a Frenchman aged 49, buried in 1809, and those of a man aged 22, bnried in 1815, crumbled into dnst from very slight pressure; of their coffins not a vestige remained.

In the vaults of the New Orleans cemeteries, a body buried in the snmmer is generally decomposed in three months; if buried in the winter, six months may be often required to separate the bones, and dissipate the offensive gases. At all seasons, when the weather is warm, fœted emanations are apt to abound. Owing to heat and hnmidity, mahogany coffins seldom last two years; those of cypress have been found perfectly sound after thirteen years.

The Delta of the Mississippi rivals that of the Nile in whatsoever may be inconvenient and insalubrious in connection with inhumation. If cremation should ever become customary, it will be more suitable for New Orleans than for most cities. Whether New Orleans is, or is not the best place to live in, is an open question, but there can be little doubt that it is one of the worst places for such as desire a cheap, dry, convenient, and comfortable grave.

The greatest anniversary in New Orleans is that of the First of November—All Saints' Day—when the city pours its living masses into the Catholic cemeteries, either as mourners for the dead or spectators of the gorgeous decorations of the tombs—a social feature highly characteristic of this as compared with any other city of the Republic. At this season, which is usually dry and comparatively cool, the decomposition of the dead is considerably retarded, and the offensive emanations are no longer insupportable. Yet at all seasons, offensive gases escape and spread through the air, as the dead are interred not *in but above* the ground. The defective construction of the tombs and vaults, the perviousness, porosity, elevation and fissures, and even falling of the brick walls, in which sometimes wood is used, the bad quality or temporary duration of the mortar, the humidity of the soil, and the heat of the sun, all combine to favor the escape of fœtid gases, which are at least repulsive, even should they not be so deleterious to the health of the city as some writers have supposed. At all seasons, and at unexpected hours, mourners will sometimes visit and continue long at these tombs, pouring out the saddest lamentations, as I have witnessed, myself unperceived, while making statistical researches into monumental histories of the dead.

Without dwelling upon the sanitary influences of the New Orleans cemeteries, it may be remarked that their moral aspect is, perhaps, conformable to the French type, as set forth by a celebrated authoress of England, whose moral tableau of the cemetery of *Père la Chaise* will close this panorama of the tomb:

"Many groups in deep mourning were wandering among the tombs; so many, indeed, that when we turned aside from one, with the reverence one always feels disposed to pay to sorrow, we were sure to encounter another. This manner of lamenting in public seems so strange to us! How would it be for a shy English mother, who sobs inwardly and hides the aching sorrow in her heart's core—how would she bear to bargain at the public gate for a pretty garland, then enter amid an idle throng, with the toy hanging on her finger, and, before the eyes of all who chose to look, suspend it over the grave of her lost child? An English woman surely must lose her reason either before or after such an act; if it were not the effect of madness, it would be the cause of it. Yet such is the effect of habit, or rather of the different tone of manners and of mind here, that one may daily and hourly see parents, most devoted to children during their lives, and most heartbroken when divided from them by death, perform with streaming eyes these public lamentations. It nevertheless is impossible, let the manner of it differ from our own as much as it may, to look at the freshly trimmed flowers, the garlands and all the pretty tokens of tender care which meet the eye in every part of this wide-spread mass of moral nothingness, without feeling that real love and real sorrow have been at work.

"One small enclosure attracted my attention as at once the most *bizarre* and the most touching of all. It held the little grassy tomb of a young child, planted round with choice flowers, and crucifix and other religious emblems, several common play-things, which had doubtless been the latest joy of the lost darling. His age was stated to have been three years, and he was mourned as the first and only child after twelve years of marriage. Below this melancholy statement was inscribed—

Passants! priez pour sa malheureuse mère!
(Travellers! pray for his unhappy mother!)

Might we not say that

Thought and affection, passion, death itself,
They turn to favor and to prettyness?"

Paris and the Parisians, 115

ART. VII.—*Absorption and Intestinal Digestion.*

TALLAHASSEE, FLORIDA.

BENNET DOWLER, M. D.:—*Dear Sir*:—If it will not be troubling you too much you will oblige me by giving your opinion on the following subject, viz.: Can food administered by the skin, rectum, or in any other way than by the mouth *into* the *stomach*, afford *nourishment* to the body?

This question has been suggested to me, by not unfrequently seeing advice given, to support life by administering food either endermically or by enemata, where the communication between the mouth and stomach was impervious, and, as it seemed to involve the important physiological inquiry into the necessity for the digestive and assimilative processes as *preparative* of the articles of food, for their purposes, I have taken this liberty which I hope you will excuse, and accede to my request by replying through the New Orleans Medical and Surgical Journal. I am very respectfully yours, etc.,

G. TROUP. MAXWELL, M. D.

Of the absorption of medicines by the skin, and by the large intestine there can be no doubt whatever. Mercurial ointment, cantharidian blisters, infusions of tobacco and stramonium and many medicines and poisons act with great energy through the skin, often without the necessity of previously removing the epidermis. The same energetic effects are more quickly and generally produced by medicated enemata. Both of these methods of medication should be more generally adopted as being very effectual in themselves, and less likely to cause injurious effects especially when gastric disease is present, than medication through that great central organ, the stomach, the more special yet not the exclusive seat of alimentary digestion.

The rapidity with which spirits and laudanum sometimes act in the large intestine in incipient cholera should be borne in mind, as it may happen that while the power of absorption by the stomach is greatly impaired or lost, that of the large intestine may not be equally affected.

The digestion of medicines in the large intestine is presumptive proof that the digestion of diet is what the general belief regards it to be, a reality. Hence, physicians direct enemata of soup, etc., as nourishment. The dogma that no digestive action can take place below the ileo-cæcal valve cannot be received as indisputable. If, in this respect the large intestine is usually inert, may it not occasionally assume vicariously, the function of the stomach in the disabled condition of the latter?

A further examination of this subject will not now be attempted.

Absorption of Medicinal Substances Introduced as Enemata into the Large Intestine.—M. Briquet read a memoir on this subject, before the Academy of Medicine, on the 30th of December last, principally in reference to quinia and its salts. The author draws the following conclusions:

"1. The fluid of which the enemata consists may readily enough be carried as far as the cæcum, and consequently be applied to an extensive absorbent surface.

2. The mucous membrane of the large intestine, and the liquids which bathe its surface, exert no chemical influence over the substances introduced into this cavity, in which nothing is absorbed but what was previously in solution.

3. When we administer by injection, per anum, salts of quinine, in solution, in a dose less than fifteen grains, a little more than a third of this quantity has disappeared, and has consequently been absorbed.

4. When doses larger than fifteen grains are administered, they are badly received, and not more than a fifth, or even a sixth of the quantity is absorbed.

5. At whatever dose we give the sulphate of quinine (by injection?) cerebral symptoms are, in common, produced only very slowly, and in minor degree.

6. No traces of absorption are perceived before an hour has elapsed after the administration of the enema, and at this time but an inconsiderable quantity has been thus disposed of.

7. The duration of the absorbing process is, in general, rather short, and seldom extends beyond two or three days at most.

8. The absorption of the alkaloids of cinchona is not sensibly affected by various degrees of dilution, within, be it understood, certain limits, by the greater or less viscosity of the liquid, nor, finally, by the addition of the salts of morphia.

9. Young people absorb better than adults; old persons of either sex absorb very imperfectly.

10. The alkaloids of cinchona, administered by enema, in doses less than fifteen grains, may produce by this means all the good effects to be expected from the alkaloids given in small doses by the mouth, and may very well be substituted for the latter.

11. The case is different with large doses; which are never absorbed in sufficient quantity to produce energetic stupefying effects (quininism?).

12. In general, larger doses than thirty grains of sulphate of quinine are not borne by the large intestine.

These conclusions are applicable in a greater or less degree to the various substances employed as enemata."—*Rev. de Thérap. Méd. Chirurg., Jan.* 15.

We may expect from the report of a Committee or Commission, appointed by the Academy of Medicine, for the purpose of an analysis of the conclusions reached by M. Briquet, which, with apparent mathematical precision, seem to be deficient in their application to clinical medicine.—*North Am. Med. Chir. Rev., May*, 1857.

ART. VIII.—*The American Medical Association.**

FROM the proceedings of the American Medical Association at its tenth Annual Session, held at Nashville, Tennessee, May, 1857, as published in the *Nashville Journal of Medicine and Surgery*, the following extracts are taken upon Medical Education, etc.

The retiring president, Prof. ZINA PITCHER, M. D., said :

We have stated with philosophical accuracy, but perhaps not with strict regard to literal historic truth, that this association was formed to repair the evils resulting from the dissevered relation of medicine to

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* Officers of the Association for 1857–8:
President.—DR. PAUL F. EVE, of Tennessee.
Vice Presidents.—R. J. Breckinridge, of Kentucky, D. M. Reese, of New York, W. H. Byford, of Indiana, and Henry F. Campbell, of Georgia.
Secretaries.—Robert C. Foster, of Tennessee, A. J. Semmes, of Washington City.
Treasurer.—Caspar Wistar, of Philadelphia.
The next place of meeting, Washington City.

the State authority. Whatever formula we use in expressing the idea, or by whatever rationale we explain our conception of the evils said to exist, for which it was designed to furnish the remedy, the records show that its mission was to reform the medical schools of the United States, and to improve the preparatory education of students of medicine.

The development of organic bodies depends upon the absorption and assimilation of extraneous materials. If the same law regulates the growth of institutions, it becomes a matter of some interest to inquire whether the schools are an out-growth of the profession, or whether the profession is the product of the schools, for in either case, there is a labor for us to perform, and the answer to this question determines the place of beginning.

Lest a doubt might arise as to the correctness of the opinion, we wish to impress upon the professional mind, that society itself, and not we alone, are amenable to censure for the abasement to which the profession of medicine had descended at the date of our associated existence, let us for a moment look into the records of the past, to see whether we cannot find an antecedent era, in which the world has been subjected to similar moral cataclysms, by which ancient institutions were broken up, their materials converted into drift, to lay the foundations of newer and more horizontal strata, from which we may draw lessons of wisdom applicable to our own time and our own condition. * * * *

If our design has been accomplished, we have shown that the work of medical regeneration is to be commenced by the profession, whose success is made dependent upon an intelligent concurrence of the popular judgment.

What is there then, gentlemen, left for us to do, but to declare the perpetuity of this association, and renew our vows of fidelity to the requirements of its constitution?

In this proclamation and in these vows are involved the pledges, that in our professional acts we will honor the principles of moral law, which lie at the foundation of our code of medical ethics. That we will use our individual influence, and so try to direct the power of this association, as to secure a higher mental culture to medical students and candidates for medical honors. When this is accomplished, the medical schools will rise in character as a correlative effect, and the profession establish for itself a legitimate claim to public confidence and popular esteem.

Dr. Boring offered the following resolutions, which he proceeded to discuss:

Resolved, That this association has not the power to control the subject of medical education.

Resolved, That the great objects of this association are the advancement of medical science, and the promotion of harmony in the profession.

Resolved, That the attempt upon the part of this body to regulate medical education, having most signally failed in its object, and already introduced elements of discord, any further interference with this subject would not only be useless, but calculated to disturb and distract the deliberations of this association.

Dr. Currey offered the following resolutions in lieu of the whole:

Whereas, The subject of medical education has been committed at each annual session to standing committees, and various suggestions have been proposed, which the association has adopted, and recommended to private instructors and to the medical colleges,

Resolved, That a committee of five be appointed by the committee on nominations, as a special committee, to be composed of members who are in no respect connected with any medical school, to devise a *System of Medical Instruction*, to be presented for the consideration of this association at its annual session in 1858.

Resolved. That the proposed system shall set forth a uniform basis, upon which our medical institutions shall be organized, as well as have reference to the best mode of securing the preparatory medical instruction to the student, and that consequently the legitimate subjects to be embraced in said system, will include primary medical schools—the number of professorships in medical colleges, the length and number of terms during the year, the requisite qualifications for graduation, and such other subjects of a general character as to give uniformity to our medical system, and preserve harmony and friendly intercourse in the ranks of the profession.

Resolved, That, upon the adoption of the proposed system by the association, all institutions which may conform to it, shall be entitled to representation at the annual sessions of this association, and none others.

Adopted.

D. Meredith Reese, M. D., LL. D., delegate from New York, reports in *The American Med. Gaz.*, of which he is editor, that "An important alteration in the constitution will come up for consideration at the next meeting. It is proposed by Professors Gunn and Palmer, of the Michigan University, and is intended to deprive the medical colleges of any distinct representation by delegates, as now; requiring the professors to be appointed in common with their brethren by the State and county societies, unless they are permanent members. Such a radical change in the constituency, will doubtless be resisted, and the proposition will be warmly discussed."

Dr. Bowling, chairman of the committee on prize essays, submitted the report of said committee as follows:

The committee on prize essays report that four essays have been received, each possessing great merit. The committee selected the following two essays for the two prizes, provided for at the last meeting of this association:

1st. One entitled "The Excreto-Secretory System of Nerves. Its relation to Physiology and Pathology," signed Henry Fraser Campbell, Georgia.

2nd. "Experimental researches relative to the Nutrition, Value and Physiological Effects of Albumen, Starch, and Gum, when singly and exclusively used as Food," signed William A Hammond, M. D., Assistant Surgeon, U. S. Army. •

ART. IX.—*Report on the Construction of Hospitals for the Insane, made by the Standing Committee of the Association of Medical Superintendents of American Institutions for the Insane, and unanimously adopted at its meeting in Philadelphia, May* 21, 1851.

1. EVERY hospital for the insane should be in the country, not within less than two miles of a large town, and easily accessible at all seasons.

2. No hospital for the insane, however limited its capacity, should have less than fifty acres of land devoted to gardens and pleasure grounds for its patients. At least one hundred acres should be possessed by every State hospital, or other institution, for two hundred patients, to which number these propositions apply, unless otherwise mentioned.

3. Means should be provided to raise ten thousand gallons of water daily to reservoirs that will supply the highest part of the building.

4. No hospital for the insane should be built without the plan having been first submitted to some physician or physicians who have had charge of a similar establishment, or are practically acquainted with all the details of their arrangements, and received his or their full approbation.

5. The highest number that can, with propriety, be treated in one building is two hundred and fifty, while two hundred is a preferable maximum.

6. All such buildings should be constructed of stone or brick, have slate or metallic roofs, and as far as possible be made secure from accidents by fire.

7. Every hospital having provision for two hundred or more patients, should have in it at least eight distinct wards for each sex, making sixteen classes in the entire establishment.

8. Each ward should have in it a parlor, a corridor, single lodging rooms for patients, an associated dormitory, communicating with a chamber for two attendants; two clothes rooms, a bath room, a water closet, a dining room, a dumb waiter, and a speaking tube, leading to the kitchen or other central part of the building.

9. No apartments should ever be provided for the confinement of patients, or as their lodging, that are not entirely above ground.

10. No class of rooms should ever be constructed without some kind of window in each, communicating directly with the external atmosphere.

11. No chamber for the use of a single patient should ever be less than eight feet by ten, nor should the ceiling of any story occupied by patients be less than twelve feet in height.

12. The floors of patients' apartments should always be of wood.

13. The stairways should always be of iron, stone, or other indestructible material, ample in size and number, and easy of ascent, to afford convenient egress in case of accident from fire.

14. A large hospital should consist of a main central building with wings.

15. The main central building should contain the offices, receiving rooms for company, and apartments entirely private, for the superintending physician and his family, in case that officer resides in the hospital building.

16. The wings should be so arranged, that if rooms are placed on both sides of a corridor, the corridors should be furnished at both ends with movable glazed sashes for the free admission of both light and air.

17. The lighting should be by gas, on account of its convenience, cleanliness, safety and economy.

18. The apartments for washing clothing, etc., should be detached from the hospital building.

19. The drainage should be under ground, and all the inlets to the sewers should be properly secured to prevent offensive emanations.

20. All hospitals should be warmed by passing an abundance of pure fresh air from the external atmosphere, over pipes or plates, containing steam under low pressure, or hot water, the temperature of which, at the boiler, does not exceed 212 degrees F., and placed in the basement or cellar of the building to be heated.

21. A complete system of forced ventilation, in connection with the heating, is indispensable to give purity to the air of a hospital for the insane, and no expense that is required to effect this object thoroughly, can be deemed either misplaced or injudicious.

22. The boilers for generating steam for warming the building should be in a detached structure, connected with which may be the engine for pumping water, driving the washing apparatus and other machinery.

23. All water closets should, as far as possible, be made of indestructible materials, be simple in their arrangement, and have a strong downward ventilation connected with them.

24. The floors of bath rooms, water closets and basement stories, should, as far as possible, be made of materials that will not absorb moisture.

25. The wards for the most of the excited class, should be constructed with room on but one side of a corridor, not less than ten feet wide, the external windows of which should be large, and have pleasant views from them.

26. Wherever practicable, the pleasure grounds of a hospital for the insane should be surrounded by a substantial wall, so placed as not to be unpleasantly visible from the building.—*Report of the State Lunatic Asylum of New York*, 1857.

ART. X.—*Case of Gunshot Wound of the Heart and Stomach:* By J. H. GRANT, M. D., of Conwayborough, South Carolina.

I WAS called, on the 3d February last, to see E. S———, who, while in the performance of the duties of a constable, received a ball from a revolver, in the hands of J. B———, a citizen of this district. Having just returned from a long ride, and having other pressing professional engagements, it was out of my power to visit him that evening. He was visited, however, by my partner, Dr. J. F. Harrell, and Dr. J. E. Grant. They reached the patient about midnight. The following note, which I received from them early next morning, will give some idea of his condition :

"3 O'CLOCK, A. M.

"*Dear Doctor:*—S. is no better. He is cold and pulseless—has vomited coagulated blood. Great restlessness, with disposition to syncope when erect. Action of the heart irregular. The ball entered a little to the right of the sternum, between the cartilages of the fifth and sixth ribs.

"We have given him opium to quiet him, etc. Please come immediately, and bring a case of instruments, as it is likely we will have to make a *post mortem* examination."

I reached the patient about 11 o'clock. Dr. H. had probed the wound : the probe entered the cavity without resistance. The pulse returned to the wrist about 6 o'clock, A. M. The patient was lying on his back, with a countenance pale and expressive of alarm and distress. The wound was plugged up with coagulated blood and effused lymph. I did not disturb it. Little or no hæmorrhage took place externally.

Appearance of the Wound.—Orifice considerably larger than the ball ; margin of orifice on a level with the circumjacent tissue—neither everted nor inverted.

Reaction had been established ; breathing free and full ; pulse tolerably firm, about one hundred per minute ; some nausea ; no pain, except when he lies on the left side, which he is unable to do, except for a few minutes at a time.

Physical Examination of the Chest.—Thoracic resonance normal on both sides ; respiratory murmur, in all parts of the chest. There were no murmurs nor abnormal bruits about the heart, but its impulse was greatly exaggerated ; sounds could be heard on back and right side of chest.

Diagnosis.—Lungs uninjured ; stomach perforated—hence hæmorrhage into the stomach, and hence vomiting blood. Evacuations per anum indicated the presence of blood. During the first night, when asked where hurt him, he replied, "My heart ; it feels as if it would jump out of me."

The man was in a stooping attitude when he received the wound. The shot was not received directly from the front, but obliquely from the right. Cardiac lesion was not included in the diagnosis ; but since the autopsy has disclosed the fact, this, taken in connection with the train of threatening symptoms—the profound and protracted collapse—receive an easy explanation: "Nature from her centre, sighing throughout all her works, gave signs of woe that all was lost."

Symptoms.—Thirst great. I may remark, once for all, that his thirst was insatiable till the last. Appetite totally annihilated.

Treatment.—He was put upon calomel and opium, the latter being indispensable to relieve pain and quiet restlessness, and the former was administered with the view to meet the violent inflammation inevitable to traumatic lesion of organs so vital.

After reaction, venesection was also resorted to, for the same purpose. The patient was subjected to physical examination of the organs of breathing and circulation, by myself, but once after this, and their condition found to be, substantially, as above stated. In two or three days after the wound was inflicted, there was observed a tendency to hypercatharsis, though no purgative medicine had been administered. This continued to augment till it amounted to a most violent and obstinate diarrhœa, prostrating the patient, and threatening to bring about a fatal issue. The only remedies that exerted any control over the diarrhœa were acetas plumbi and opii, with interposed doses of mist. creosote; a large blister was applied over the abdomen, and in a few days reäpplied. Finally, brandy and other diffusible stimulants—quinine.

This diarrhœa undoubtedly pointed to severe lesion of vital organs. In about fifteen days the system was brought under the specific influence of mercury; the mouth became sore—the pulse fuller and somewhat slower; he took rice water, and seemed more lively, and hopes were entertained of his recovery. The diarrhœa, however, continued, with more or less severity to the last. He died on the first day of March. The next day, sixteen hours after death, we examined the body. Present, Drs. John H. Grant, J. F. Harrell, and James E. Grant.

Cadaver.—Great emaciation. (I shall omit such necroscopic phenomena, external and internal, as are irrelevant to the object for which this examination was made.) The orifice of entrance was well healed and cicatrized, so that a probe could not be passed through it. A crucial incision was made in the epigastrirm, and the sternum turned back in the usual way. Lungs sound; no adhesion to pleuræ. No effusion of any kind, nor blood, in cavities. A perforation was readily found in that part of the pericardium corresponding to the external orifice and direction of the ball. Upon removing the pericardium, a well defined cicatrix was seen on that part of the heart opposite the perforation in its capsule. The ball entered the right ventricle about an inch from the apex, and emerged from the same on the under side of the heart, before going far enough to enter any other cavity. The points of entrance and exit about two inches apart. The points of exit from the heart and pericardium were not so well defined as those of entrance; the vessels were much injected and the capsule adherent to the heart at that point. This membrane presented marks of inflammation throughout. It contained no fluid. The path of the ball within the ventricle was easily traced; the columnæ carnæ presented at different points bright red spots of an erysipelatous appearance. If these appearances left the shadow of doubt on the mind, in reference to the cardiac lesion, this was dispelled by the discovery of particles of extraneous matter within the endo-cardial tract. In this were found two hairs and some minute particles of white cloth. These hairs, upon being subjected to microscopic examination, were proved beyond all doubt to have come from the exterior of the chest. Attached to one of these hairs were some minute fibres of white cloth, also. The ball, upon being placed under the microscope, presented minute fibres of white cloth, adherent to its surface. The source of these fibres was doubtless the man's shirt.

A little anterior to the cardiac orifice of the stomach was found a well defined cicatrix, where the ball is supposed to have entered. The organ was perfectly empty, and much contracted or collapsed. The track of the ball through the diaphragm, and the point of exit from the stomach, could not be recognized. These organs, particularly the latter, bore marks of inflammation. The abdominal viscera presented marks of extensive morbid action, particularly the small intestines and their investments. The ball was found resting on the left kidney. This viscus, with its supra-renal capsule, presented a contused and congested appearance.

Remarks.—I might have extended this communication to a much greater length, but my object was to confine myself to the facts relevant to the point at issue.

The above case is remarkable for the length of time the subject of it was in the state of collapse—fifteen hours—if we suppose the system succumbed directly after the wound was inflicted.

It is exceedingly remarkable that a man could live a single hour with traumatic lesion of organs so vital. Further, it is remarkable as regards the length of time he lived without taking any nourishment—twenty-six days.—*Charleston Med. Jour.*, May, 1857.

Art. XI—*Cyanosis:* by Prof. Carson. (From *Trans. Coll. of Physicians* of Philadelphia, Dec., 1856.)

Dr. Carson read the following report of *a case of Cyanosis.* The subject of the following case having lived, in opposition to so many physical obstacles, during a surprisingly prolonged period of time, I have regarded all the details connected with its history as interesting and worthy of record, and have therefore taken considerable pains to note and preserve them.

S. R. was born in Philadelphia, January 26, 1836, and at the time of his birth, was a perfect specimen of cyanosis. He passed through the stages of infancy with no unusual derangement of health, not having developed, however, as his brothers and sister, but remaining puny and contracted in his growth.

In April, 1842, he was attacked by hooping cough, which was of great severity in consequence of the difficulty of respiration on the occurrence of the paroxysm, and attended, from time to time, with profuse hæmorrhage from the lungs. From this he recovered slowly, and afterwards, until the winter of 1848, was apparently in good health. I had not occasion to inquire minutely into his condition prior to the attack mentioned, but, at that time, my attention was closely directed towards him, and subsequently, his case was studied attentively. When he was in the best state of physical existence, the following were the features presented: Countenance rather dull, except when roused by emotion, with a leaden hue of the skin; expression of the eye clear, but the adnata permeated by deep crimson vessels; lips, gums and tongue, purple; person small, but slowly increasing from year to year; extremities delicate, with a remarkable enlargement and incurvation (from curvature of the nails) of the ends of the fingers and toes, which were as deeply tinctured as the lips and tongue. The chest was narrow and contracted, prominent in front, and evinced a series of phenomena which were constant until his health began to fail, viz.: perfect resonance on both sides, before and behind; respiration louder than usual, with no marked signs of pulmonary embarrassment. The impulse of the heart was strong, extending half an inch further on the right side than natural, and seen conspicuously when the chest was exposed; the frequency of beat amounted to eighty per minute. The action of the heart was accompanied with both sounds, the first sound most feeble, and also a peculiar blowing sound, which was perceptible not only when the ear was applied directly over the heart, but at some distance on the sides of the chest. He participated in the active exercises of boys, at which times I noticed that his respiration was much hurried, but he did not appear to suffer, had a good appetite, good spirits, and an active inquiring mind, which led him to apply himself to his studies, and to excel in such as were presented in succession with advancing age.

In the year 1843, with the view of determining the effect of position upon the cyanosed condition, Dr. Pepper and myself instituted the following experiments:

1. When laid upon his back, with his shoulders moderately elevated, the chest presented some prominence over the cardiac region. Impulse of the heart not strong, beats eighty per minute; dulness on percussion of the cardiac region; pulse regular, but feeble; in the carotids, the same as at the wrist. *Bruit de soufflet* distinct. Respiration twenty per minute. The right hand was elevated for two minutes, when it lost its color; while the left, being pendant, increased in blueness. This trial was now reversed, with the same result.

2. He was placed upon his left side, and in thirteen minutes, the lividity in the lips and the hands, which were placed at rest, horizontally, was diminished, but the left side of the face, where it rested on the pillow, was more injected than the other. In fifteen minutes, no greater effect had taken place. He was now made to lie on his right side, and in fifteen minutes, as much, but no greater, diminution of the blueness had occurred as when upon the left side.

3. With the view to excite the circulation, we directed him to run up stairs and return. He then presented excessive lividity of the lips,

cheeks and hands, great difficulty of breathing, the heart acting tumultuously, and the pulse rapid and irregular. He was placed on his left side, aud, in fifteen minutes, the condition was the same as when this had been practised in the previous experimeut. He was again directed to run up stairs, and, on returning with the same symptoms, was laid on his right side. In fifteen minutes the same diminution of color took place, and calmness occurred as before, when he had been placed upon the left side, but not to a greater extent, or more rapidly.

4. After inducing augmented blueness by the same exercise, he was laid upon his back, and here, again, it was ascertained that the excessive lividity disappeared with as much rapidity as when placed either on the right or left side.

During the winter of 1848–9, he had an attack of hæmorrhage from the lungs, connected with pneumonia, from which he recovered, and in the spring, resumed his school duties, but his general health was not so good as previously, and during the ensuing autumn, when the cold weather set in, he was obliged to relinquish his studies, becoming a confirmed invalid, and evidently declining.

April 25, 1850, I visited him, and noted the following symptoms: Much emaciation of the whole frame, with extreme delicacy of the upper and lower extremities; countenance pinched, of a leaden hue; eye dull; lips and tongue of a pale purple; pulse, one hundred and sixteen, quick and thready; respiration, thirty, sighing; impulse of the heart decided, but not forcible; sounds of the heart merged into a rough, rasping sound, heard over the whole front of the chest; respiratory murmur louder than natural in the right lung, both anteriorly and posteriorly. In the anterior of the *left* lung, the souuds were masked by that of the heart, but, posteriorly, the middle lobe presented some dulness on percussion, and a distinct, crepitant murmur. Some cough existed, especially at night, with thick, tenacious sputa. He could uot remain long in the recumbent posture. Skin cold and moist; tongue coated; appetite poor; bowels regular; complained of erratic pains, aud, of late, has suffered from prolapsus ani. Treatment sustaining, and to relieve his sufferings.

August 1. From the time before specified, has been gradually failing; the emaciation has become extreme, and the difficulty of breathing has become so oppressive, as to preclude repose in the recumbent position; respiration hurried, thirty-five per minute; pulse, quick and tense; skin cool; mucous membranes becoming dry and foul; extremities swelling. The anterior of the chest presented the rough, blowing sound, with bare perception of the two sounds of the heart. There was dulness on both sides of the chest, before and behind, and no respiratory murmur discoverable on either side, but, at the upper parts, tubular sounds, and some crepitation, or submucous râle.

16th. Patient, after having suffered under almost agonizing pain through the chest, extending to the extremities, with difficulty of respiration, amounting to asphyxia, the lividity of the face and hands becoming extreme, and cold, clammy perspiration covering his whole body, died at 2, P. M.

Post-mortem Examination.—Sixty-eight hours after death an autopsy was made. The body was exceedingly thin, and the blue tinge of the skin very apparent. The examination was made by my friend, Dr. F. W. Sargent, from which I took the following notes :

Chest.—Upon laying bare the sternum and removing it, strong adhesions were overcome. On endeavoring to remove the lungs, they were found bound to the sides of the chest by strong membranous connections, the result of pleuritis on both sides, but firmer on the left. *Lungs* filled with tubercles as large as peas, as well as in smaller masses, congested, and in some portions hepatized, the posterior portions of both in a state approximating softening, sinking in water. Pericardium adherent firmly to both right and left lung, containing f℥iss of serum. The heart was located with its right edge under the centre of the sternum, the base opposite the second rib, and the apex between the fifth and sixth ribs, length three inches, transverse diameter three inches two lines, much distended with blood, and filled with soft coagula. Auricles distended ; *foramen ovale open,* large enough to admit the forefinger (one half inch in diameter.) *The right and left ventricles communicated with each other,* there existing, in fact, but one cavity, the septum being wanting, with the exception of half an inch at the lower part, formed, apparently by a transverse development of the columnæ carneæ. The diameter of the opening between the ventricles was one and seven-eighths inches. The thickness of the walls of the ventricles was very nearly equal—five lines. The substance of the entire organ was flabby. The circumference of the aorta, at its origin, was two and one-sixteenth inches—that of the pulmonary artery was one and five-eighths inches. One of the musculi papillares of the tricuspid valve had its origin at the posterior wall of the right ventricle lower than usual ; valve of the foramen ovale natural ; the mitral valves, normal, as well as the semilunar of the aorta and pulmonary artery.

Liver, large, deeply-colored ; kidneys, firm—apparently natural. The abdominal organs healthy.

There are several points worthy of note in the history of this case. The subject of it lived exactly fourteen and a half years, and, from the time of his recovery from hooping cough in the spring of 1842, until he was attacked by pneumonia in the winter of 1848, appeared to be in good health. The cyanosed condition, although modifying his growth, and producing the peculiar phenomena connected with it, which have been mentioned, did not affect his spirits, or produce hebetude, but, on the contrary, his mind was active and capable of effort. When in the best state of health, as reported in the notes, his respiration presented perfect resonance on both sides, and was louder than usual. Without apparent pulmonary embarrassment, except when in exercise, yet the extreme engorgement to which the lungs could be subjected, was shown by the profuse hæmorrhage which occurred during the attack of hooping cough. From the date of the attack of pneumonia, a difficulty in his respiration exhibited itself, becoming more and more serious in proportion to the advancing disease of the pulmonary structure and its accompanying hypostasis, until, under this combination of local circumstances, he succumbed after an unusually prolonged struggle. *Post-mortem* examination revealed a heart without the septum between the ventricles and patulous foramen ovale, with a marked disparity between the openings of the aorta and pulmonary artery, and disease of the lungs of the most serious nature.

The first aspect of the case from the resemblance to a single heart, might induce the belief that the cyanosis depended upon an equal commingling of venous and arterial blood in the general circulation ; this is the causation of the disease which has been adopted by several authorities. Untenable as this supposition has been shown to be by the occurrence of just such malformation in cases where no cyanosis existed, this case does not present this sole aberration ; an inequality existed, of a very anormal character, between the aorta and the pulmonary artery. By referring to the admirable paper of M. Bizot,* it will be found that the circumference of the opening of the aorta, at the age of fifteen years, in the male, is twenty-two and three-fourths lines, while the circumference of the opening of the pulmonary artery is twenty-three and three-fourths lines (the French measurements have been reduced to the English.) If we compare the measurements of the same openings, in the heart under consideration, with these, it will be seen that, for the aorta, there is given two and one-sixteenth inches, or twenty-four and three-fourth lines, which is two lines more than natural, and for the pulmonary artery there is given one and five-eighths inches, or nineteen and one-half lines, which is less than natural by four and one-fourth lines. In the normal state of the heart, the opening of the pulmonary artery exceeds that of the aorta by a line, while, in this case, it is less than the aorta orifice, the difference between them amounting to five and one-fourth lines, a little less than half an inch. It cannot be doubted, then, that in this slight enlargement on the one side, and decided contraction on the other, there existed a cause of embarrassment to the circulation, which places the case in the category of those produced by pulmonary difficulty. That the heart had difficulty in emptying itself, is apparent from the constant bellows murmur, which increased as disease of the structure of the lungs set in, and from the strong impulse perceptible on inspection, which accompanied the action of the organ. The walls of both ventricles exhibit a departure from the normal thickness, that of the left exceeding the natural measurement by a line, and that of the right augmented three lines ; or contrary to the usual structural arrangement, which gives four lines for the thickness of the wall of the left ventricle, and one and one-half for the right, they were nearly equal, thus more closely conforming to the idea of a single ventricular cavity. Whether this augmented thickness was congenital or acquired, cannot be determined, but, from the length and breadth of the organ corresponding to the standard measurement, we are induced to believe it was the former.

That difficulty in the pulmonary circulation did exist, although, in the early portion of the history of the case, not sufficiently marked to arrest

* Recherches sur le Cœur et le Système Arterial chez l'Homme, par J. Bizot (de Génève.) Mémoires de la Société Médicale d'Observation, tom. i., Paris.

attention, is clear from the ready occurrence of hæmorrhage first under the influence of hooping-cough, and then of pneumonia. The condition of the lungs as found, was in a great measure, the result of fixed hypostatic congestion, on which had engrafted itself the tubercular element.

We have been induced to report the case as confirmatory of the views entertained by our lamented fellow-member, Dr. Moreton Stillé, and so well sustained in his inaugural thesis on Cyanosis, published in the *American Journal of Medical Sciences.*

Dr. West referred to a case of malformation of the heart and great vessels, reported by him, with some remarks upon cyanosis, to the Pathological Society of Philadelphia, and published among its Transactions, in the *Med. Examiner* for November, 1842.

The case of Dr. Carson confirmed the views which he had then taken in regard to the production of cyanosis.

The subject was a boy, eight years of age, who had exhibited no marked discoloration of the skin, until after an attack of pertussis when he was fifteen months old, and even subsequently to that period, his parents had at times noticed the entire disappearance of the blueness when he was sitting erect, and perfectly quiet.

He was suddenly seized with a violent convulsion, which was repeated on the third day afterwards, when he almost immediately expired. The heart in its substance, its coronary vessels, and in all its cavities, was found, after death, remarkably turgid with dark blood. The actual capacity of the right cavities was nearly double that of the left ones. The foramen ovale was closed. The two ventricles and the aorta communicated by a circular opening about half an inch in diameter. The aorta had an origin from each ventricle. The most interesting peculiarity presented by the specimen, was found in the condition of the pulmonary artery. This vessel was almost entirely occluded at its origin, which presented a small papillary eminence, through which a passage scarcely capable of admitting a large pin, was continued to the superior corner of the right ventricle. The supply of blood to the lungs was furnished by the ductus arteriosus, which was still open within the pulmonary artery. At the point where this duct opened, there existed a kind of valvular arrangement. The duct passed directly across from the aorta to the pulmonary artery, and at right angles to the course of the latter vessel, occasioning, necessarily, the blood which reached it, to branch off into two directly opposite currents. From this arrangement, it can readily be seen that the flow of blood from the right ventricle into the lungs must have been greatly retarded, the whole of it, nearly, having to pass at several right angles, after leaving the heart; as a consequence of this retarded movement of the blood, congestion of the whole venous system must necessarily have been produced, that of the skin exhibiting itself in the form of cyanosis.

The venæ cavæ, too, instead of entering the heart separately, were first united into a common trunk, which joined the auricle exactly at a right angle, a further impediment being thus offered to the return of the blood to the heart, of course assisting in the production of congestion throughout the whole venous system.

Dr. Condie said: I regard Dr. Carson's case as a very interesting and important one. The number of cyanotic persons who reach adult life, is by no means inconsiderable; many such cases are on record. The causes of cyanosis in children who perish, are often quite independent of cardiac lesions, and still more so in those in which the discoloration is only temporary. In many cases, the blueness disappears immediately after the occurrence of a free discharge from the bowels, and hence I am accustomed, when the skin is purplish, to give a purgative dose of castor oil. In very many cases of alleged or supposed overlying, I have no doubt that the child's death is attributable to imperfect expansion of the lungs. In the course of one year, I met with three such cases. In two of them, a coroner's inquest was held, and, on examination, the lungs were found to be in a state of atelectasis, quite in the fœtal condition, like the liver in texture, and sinking when thrown into water.

Dr. Carson remarked, that a cause of cyanosis, which had not been alluded to by the authorities on the subject, is congenital dropsy, when the mother is suffering from this affection at the period of her labor. He alluded to a case in which the mother was the subject of general dropsy at the time of parturition, and the child, when born, affected with universal watery infiltration, distending the limbs, the body, and the face, was in a deeply cyanosed condition. He regarded the cyanosis as depending upon a similar infiltration into the cellular tissue of the lungs, impeding respiration. As soon as this cause of venous congestion was removed by the subsequent administration of a purge, the cyanosis disappeared.

Dr. Condie said: I am enabled to confirm the remarks made in reference to the causes of cyanosis, by another case in point. I had a little patient affected with œdema of the lungs. As the attack advanced, its color became gradually more and more dusky, until it acquired a perfectly cyanotic hue. On examination of the body after death, no lesion having any connection with the symptoms was discovered, except general and complere œdema of both lungs, by which the expansion of the air cells and the pulmonary circulation were rendered impossible.

Art. XII.—*Observations on Dysentery*: by J. L. Abernethy, M. D., Concord, Tennessee.

What is dysentery? This interrogatory has, doubtless, propounded itself to the mind of every scientific member of our profession, yet the problem has never been explained, so as to be of practical importance to the medical fraternity, or of benefit to suffering humanity. The theories existing are too numerous to relate. Pathologists, however, harmonize more in regard to its nature than its therapeutics. There is no disease in the whole catalogue of human complaints, that has received as varied a treatment, as the one under consideration. No two authors agree, in every respect; no two practitioners coincide in every particular; and many eminent ones occupy antagonistic positions.

They tell us on the other side of the Atlantic, that dysentery is "purely an inflammation," and the theory, in this indefinite condition, has been endorsed, to some degree, on this side of the "Great Waters." The expression of the above quotation, is very vague and meaningless. Gonorrhœa is "purely inflammation," and, so is gastritis, yet they differ wide in their pathology, etiology and therapeutics. In general terms, dysentery is "purely an inflammation;" but what kind of an inflammation is it?

There are two kinds of inflammation—common and specific. They differ in respect to the causation, and the tissue complicated. The causes of common inflammation are traceable, definite and direct, while the causes of specific inflammation are obscure, indefinite and indirect. The common phlogosis is mostly confined to deep-seated tissues, while the specific variety is generally situated on the skin and mucous membranes. Erysipelatous inflammation is the general nomenclature for inflammatory affections of a specific character, of the skin and mucous membranes.

Is dysentery a specific inflammation? Our answer is in the affirmative. Now for the proof. We will take np and examine the different phases of the disease, and see if the theory advanced can be sustained.

Dysentery is situated, or located, generally in the sigmoid flexure of the colon, or the adjacent intestine, below or above, more frequently below. Why is it that it always attacks this part in preference to any other portion of the alimentary canal, or any other caual with a mucous membrane? Let us make four divisions of the alimentary tube, and briefly examine their anatomical structure separately, and then compare the result. First, the œsophagus, is composed of three coats, layers or membranes. They occupy the following relation to each other: 1st mucous; 2d cellular; 3rd muscular. The first, or mucous membrane, has a basement membrane which is profusely supplied with bloodvessels and nerves. The second, or cellular coat, connects the muscular with the mucous membrane, and transmits the bloodvessels and nerves, from the muscular to the basement of the mucous membrane, consists of two layers; the fibres of the external are longitudinal, and those of the internal are circular. The stomach is of the same structure, excepting the addition of a fourth or serons coat. The small intestines, like the stomach, possess four membranes. The mucous membrane is longer than either of the other layers, and hence must be thrown into numerous folds, which are called valvulæ conniventes. They differ from other folds of mucous membrane in being fixed or permanent. The surface of the mucous membrane, is covered with a number of papillary projections, called villi, which impart a soft and velvety feeling to it. In the small intestines are found the follicles of Lieberkuhn, glands of Peyer and Brunner, and the solitary glands. Let us now descend to the large intestines, and examine their construction. Here we find a mucous membrane, not unlike that of the small intestines, excepting the absence of the valvulæ conniventes and villi; it is whiter, thicker and coarser than the mucous coat of the small intestines. The follicles or crypts are numerous. The cellular layer is the same as found elsewhere in the alimentary canal. The muscular membrane, like that of other portions of the intestines, consists of two fibres, longitudinal and circular. The serous coat is the same as found everywhere, only it has numerous folds of fat, which are called appendices epiploicæ.

We have briefly run over the anatomy of the alimentary tube, and find its structure pretty much the same, from the mouth to the anus. We have examined in vain, for a reason why dysentery should be located where it is. There is no rational or explicable reason revealed by anatomy, why it should be situated in the sigmoid flexure of the colon; if there was, then there would be one argument less in favor of the theory advanced.

Pathologists, who call dysentery "purely an inflammation," inform us that there is none of that redness and softening, revealed by pathological investigation, that is so characteristic of gastritis and enteritis; but that there is always more or less ulceration, and in many cases, the diseased bowel is an "irregular, confused and tattered mass of disorganization." Why is it that in enteritis or gastritis there is redness and softning, and in dysentery the bowel is ulcerated, and is often an "irregular, confused and tattered mass of disorganization?" Pathologists explain why this difference in pathological lesions, and another argument is crushed.

The danger to be apprehended in typhoid fever, is peritonitis resulting from perforation of the intestines, and in this fever every organ and tissue of the system is in an unfavorable condition to take an inflammation, because the very elements, or, at least, the concomitants of inflammation, are below the normal standard; yet, in dysentery, when, according to the common hypothesis, the elements of inflammation are in the excess, and the bowel ulcerated, and often an "irregular, confused and tattered mass of disorganization," extensive peritonitis rarely supervenes. Why is this? Because inflammations differ in respect to the tissue diseased, and specific inflammations never attack serous membranes—have no affinity for them.

The most important and pathognomonic sign connected with the symptomatology of dysentery, are the hæmorrhagic discharges. Is hæmorrhage a natural consequence, and concomitant of inflammation of mucous membranes? Most assuredly not. Inflammation of the mouth and œsophagus is not attended with hæmorrhage. Hæmatemesis is no indication of gastritis.

In enteritis, there are no hæmorrhagic evacuations. And all these diseased organs have their cellular membrane profusely supplied with bloodvessels and nerves, afferent and efferent, direct and indirect from the spinal cord. The bleeding, which is sometimes excessive and alarming, that occurs in dysentery, establishes beyond all cavil, the specific character of the disease.

The period of the year in which dysentery prevails, and commits its desolating ravages, indicates much in favor of the theory advocated.

All common inflammations are most rife in the cold, dreary and desolating winter, and the ever vacillating vernal months. They are more frequent at these periods, because their causes are more abundant, direct and definite, than at any of the other seasons of the year. The disease under consideration, makes its appearance in the latter part of summer, and generally disappears at the approach of cold weather. These facts are unquestionable evidence, that the cause or causes of dysentery are quite different from the etiology of common inflammations; and inflammations are classified, common or specific, according to their causes. Cold is one among the chief causes of inflammation, but it cannot produce dysentery, for then the disease would be mostly confined to the period when ordinary local phlegmasia exists. Imprudencies of every kind are a prolific source of common inflammations. It is true, the violation of the laws of nature is detrimental to health, and may hasten on, and aggravate the symptoms of any disease, epidemic or endemic; but to suppose that dysentery is dependent upon imprudencies of any description for its existence is the very height of supererogation. It is no respecter of persons. Its frequency is as great, in the affluent mansion, as in poverty's hovel. It is found as often, and its mortality is as great, on the mountain's top, where health-disseminating breezes waft, as along the river shore, or in the low and marshy lands, whose poisonous effluvia pervade the atmosphere.

The etiology of dysentery, like that of those terrible scourges, algide cholera and yellow fever, is much in obscurity. The chief cause—the predisposing cause—is essentially epidemic. It exists in the atmosphere, manufactured or brought about in some manner, by unnatural changes or conditions of the summer and autumnal seasons. The exciting causes are any and everything, that has a tendency to undermine the normal foundation of the whole system of organs of the human economy.

If dysentery was a common inflammation, venesection to decrease the volume of blood, mercury to diminish the amount of, and check the formation of fibrine, tartar emetic to reduce the action of the heart, and equalize the circulation, and numerous other antiphlogistic agents, would check the disease as quick as they would pleurisy. Will antiphlogistics cure common inflammation? They will. Do they cure dysentery? Would to God they could, but they can't! Experience has taught that we may bleed, mercurialize and antimonialize, and the tormina, tenesmus and hæmorrhage will continue unabated, if not, in many cases, aggravated. In many cases of a very acute nature, in a plethoric patient, the judicious employment of the lancet is of great advantage; but in a large majority of cases the prostration contraindicates it. Experience has taught, that blood-letting has no influence over the duration of the disease. Mercury as a sialagogue—not as a defibrinizing agent—is generally beneficial, because the secretion of the liver is invariably checked. Tartar emetic is of no advantage.

Anodynes and cathartics are the remedies most successfully and generally employed. Injections of nitrate of silver through long tubes are thought to do good. The treatment that is generally employed at this time, and the fatality of the disease, point distinctly to a specific disease. But to tell what kind of treatment is best, is not the object of these "observations." That is reserved for a future paper.—*The Southern Jour. Med. and Physical Sciences*, for May, 1857.

ART. XIII.—*State Medicine in France and England.* (Concluded from the January No.)

France.—The existing organization of Councils of Hygiène and Public Salubrity, is based upon the decree of December, 1840, and of additional decrees, dating 1849 and 1851. In the chief city or town of every *arrondissement* in France a council of hygiène exists, and in every canton a committee of public health.

The Councils of Hygiène consist of not less than seven nor more than fifteen members, appointed for four years, one-half retiring every two years, but eligible for reëlection. The members are medical men, agriculturists, commercial men, proprietors, mayors, engineers, magistrates, and others who, by education and social position, are regarded as capable of judging of matters of hygiène. The medical elements of these councils are distributed as follows:—In a council consisting of ten members, there will be four doctors of medicine or surgery, two *pharmaciens*, and one *vétérinaire;* in a council of twelve members, there will be five doctors, three *pharmaciens*, and one *vétérinaire;* in a council of fifteen members, there will be six doctors, four *pharmaciens*, and two *vétérinaires*. The advice and assistance of civil and military engineers, official architects, and of the chiefs of the police departments, may be called for if required by the councils, although they may not be members thereof.

The really local character of these councils of health is evident from the fact that, out of 1742 members thereof, 1544 are resident in the chief towns of the several *arrondissements* and departments, while the remaining 198 reside at greater or less distances within the department or *arrondissement*, and include the most important and most distinguished of their inhabitants.

The proceedings of the several councils of the *arrondissements* are subjected to the consideration of the councils for the departments, whence they are annually transmitted, through the Central Council of Hygiène in Paris, to the Minister of Commerce.

Paris has its own special arrangements relative to public hygiène, known as the Council of Hygiène and Salubrity of the Department of the Seine. In each of its *arrondissements*, a commission of nine members, presided over by the mayor of the *arrondissements*, in the city, and by the sub-prefect in the suburban districts. Besides certain of the principal inhabitants, there shall always be, in each commission, at least two physicians, a *pharmacien*, a *vétérinaire*, an architect, and an engineer. These members are nominated by the prefect of police, from a list of candidates prepared by the mayor or sub-prefect of each *arron-*

dissement or rural district. The members are elected for six years, one-third going out every two years, the retiring members being eligible to reëlection.

These councils and commissions meet not less frequently than once a month, and more frequently if the public service require it. They shall point out to the prefect of police all causes of insalubrity existing in their districts, and shall give their advice on the means of their removal; and may be required to give their advice also to the departmental councils. They may be called upon to execute extraordinary measures for the suppression of epidemic disease.

Among the duties of the councils of hygiène are, cleansing of localities and habitations; the adoption of measures to prevent the spread of epidemic and infectious maladies; the extension of vaccination; the organization and supply of medical assistance to the poor; the means of improving the sanitary condition of industrial and agricultural populations; the salubrity of factories, schools, hospitals, asylums, barracks, prisons, etc.; questions relating to foundlings; the quality of food; the improvement of public mineral waters, and the rendering these available to the poor; the removal or suppression of dangerous or insalubrious establishments, or nuisances; the supervision of public works, such as the construction of prisons, schools, canals, reservoirs, fountains, cemeteries, sewerage, etc., etc.

These councils shall also collect the statistics of mortality and its causes, together with the topography of each *arrondissement;* and shall regularly transmit all such documents to the prefect, who shall forward them to the Minister of Commerce.

A central council of hygiène and public health, at the seat of government, presides over all the other councils, and over medical affairs in general, and is charged with the examination of all questions on hygiène referred by these, or put before them by the Minister of Commerce and Agriculture. The members, seven in number, are nominated by the same functionary; they consist of four doctors of medicine, a civil engineer, an architect, and a secretary, having a consultative voice. They may require also the attendance of one member respectively of the Military and Marine Councils of Hygiène, of the perpetual secretary of the Academy of Medicine, and of certain public functionaries—e. g., the chief of the police department, the architect, the chief of the post-office packet department, of the administration of tolls, etc., etc.

The *Criminal Code* (Art. 44) directs that, in the event of a violent death, or of one to the cause of which suspicion may attach, the procureur shall call in the aid of an *officier de santé*,* who shall submit to him a report upon the condition of the body, and the cause of death In the *Civil Code* it is directed that when suspicion exists of violent death, interment shall not take place until a police officer, assisted by a doctor of medicine or surgery shall have prepared a *procès verbal* as to the state of the body, and other circumstances, such as the name, age, residence, etc., of the deceased. The choice of the medical officer is

* In the words of M. Devergie, "L'expression *officier de santé*, qualifié un homme apte à donner des soins en cas de maladie, et pas autre chose. On n'y entend pas un grade, un rang dans l'hierarchie médicale." (Tom. i. p. 4.)

left to the magistrate, who, although the matter is of equal weight in either case, may call upon a physician, being an *expert*, or upon an *officier de santé*, who in the medical hierarchy has no rank, or only the lowest. The education of the *officier de santé* is inferior to that of the physician or surgeon, his functions are restricted, surgical operations not being performed by him. The *officier de santé* seems, in fact, to occupy a position in some respects similar to our now obsolete "apothecaries," but the former does not practice pharmacy.

It must be supposed that the framers of the above cited clauses of the criminal and civil codes regarded the mere skill in making a technically-expressed report as being of higher value than the scientific qualifications of the individual to whom an important public duty was to be assigned by the magistrate; or they may have considered that a mere *officier de santé*, on the spot, in the communes or rural districts, would be more suitable for these investigations than a physician residing at a greater distance. The result, however, is that the opinion of an *expert* is frequently required in a subsequent stage of the proceedings; Article 43 of the Criminal Code giving the procureur the power to summon the assistance of whomsoever he may deem the most skilled in his profession.

The official reports of the *expert* must contain all the information which his experience shall enable him to suggest, relative to the presumed intention or premeditation of an alleged crime so far as inferences may be drawn from the appearances of the body, of wounds, or of the character of weapons found.

An autopsy is performed upon the authority of the procureur or his deputy. Exhumations are ordered only in extreme cases. The autopsy is to be performed without delay, and the authorities are required to see that the investigation is closely conducted, and that traces of crime are not thereby obliterated.

The reports of *experts* are of three kinds, viz.: judicial, administrative and estimative. The *judicial* or *official* have for their object the elucidation or discovery of an alleged crime. The *administrative* have reference to questions touching public health. The *estimative* refer to disputed remuneration. Besides these reports, the *expert* is frequently called on to give a simple certificate or statement of a fact, not in behalf of justice, or attested by an oath, but for inaccuracy of which he is, nevertheless, amenable to punishment.

We may represent, by an imaginary case, the mode of proceedings and position of the *expert* in France.

Supposing that a man is found dead in a room, the police requires the attendance of a doctor, or *officier de santé*, to attest the death, and to state the probable cause of death. Should any wounds or other indications of violence be apparent, these must be noted; and simply confining himself to the facts before him, the medical man must, in a *procès verbal*, state his suspicions, and indicate whether or not these require that the body be opened.

By a police ordinance of 1801, every medical man is required immediately to report to the police the particulars of every violent or accidental death to which he may have been summoned.

This primary report is forwarded by the police to the *procureur*, who, if he consider the suspicions of a crime to be sufficiently strong to call for further proceedings, appoints a *juge d'instruction*, who then nominates two physicians to inspect the body in the presence of either himself or his deputy. These physicians draw up an official report of what they observe, with their interpretation of the facts, and the conclusions thence to be drawn.

These two reports may, however, fail to explain with certainty the cause of death, or they may raise difficulties not previously contemplated. For the solution of these facts, the *juge d'instruction* shall charge two or more physicians with the duty of examining and advising upon the preceding reports; at the same time he shall submit to their consideration all other documents that may tend to throw light upon the inquiry. All these are digested and discussed in a *medico-legal consultation*, in which the last *experts* examine, in all their bearings, the facts and conclusions drawn by previous reporters, either confirming or reversing these. This "consultation" is not the subject of a special law, but is governed by those which rule the production of the "reports;" the several *experts* being convened by the *procureur*, or magistrate, in the regular form of summons for a report.

The medico-legal "consultations" may have two different sources—they may be demanded either by the accused, or by the judicial authorities. They are usually held before judgment is passed; but if the condemned have an opportunity of appeal, he may demand a "consultation" subsequently—sometimes with the effect of reversing the sentence. The strictest impartiality is enjoined upon the *experts*, whether engaged by the defense or the accused, with the proviso, that, in case of doubt, the benefit be given to the accused.

The *experts*, thus called in "consultation," do not necessarily reside in the locality where the alleged crime was committed, but may, if advisable or necessary, be summoned from a distance. Or it may happen in more grave cases, such as poisoning, assassination, etc., that there may be a difference of opinion among the *experts* who have investigated the affair on the spot. Under these circumstances, the magistrate addresses to the local *juge d'instruction* a *commission rogatoire*, by which he is authorized to require the opinion of certain *experts*, the choice of the latter being frequently left to his discretion. The limits of the "consultation" are much less restricted than are those of the "reports," which consist simply of a statement of facts and conclusions. In the consultation every fact must be discussed and fully commented upon, the commentary being strengthened by all suitable arguments, and illustrated by reference to the statements and opinions of authors. The names of the previous "reporters" are in all cases concealed from the consulting "experts," lest the authority or insignificance of a name should exert its undue influence upon their judgments. The several parts of the evidence are separately examined by each expert, previously to their joint consultation. The result of the consultation is delivered in four distinct parts:—1. The preamble, a simple enumeration of the points submitted for deliberation. 2. The exposition of facts, in which all the circumstances and events are set forth in their exact order. 3. The discussion of the facts, which is the most difficult portion of the duty of the experts, requiring much sagacity and discrimination, and demanding research, experiment, scrutiny of proofs, and the collection of facts, for the guidance of the magistrate or judge. 4. The conclusion, in which the results must be briefly and clearly stated, together with the grounds of difference (if existing) from the conclusion of previous reporters.

It is apparent that the "expert" must possess not only practical skill, but should have also an extensive and ready acquaintance with the recorded facts and opinions of medico-legal writers. Their reports constitute the ground of action determining the prosecution or abandonment of legal proceedings; and in the event of trial, they are in the position of witnesses, although, as observed by M. Devergie, they are there in a false position, since, as representatives of science, they should not be called upon to advocate any particular interest. At the tribunals, the "expérts" are required to depose to all that they have observed, and recorded in their reports; they have, moreover, to respond to questions put either by the judge, the jury, or the procureur. Their replies may give rise to further explanation, and the demand for additional evidence, and occasionally lead to controversy and discussion in the court between experts on the side of the prosecution and of the defence. To this M. Devergie very justly objects, and urges that the duty of the expert should be confined to the statement and the interpretation of facts and their legitimate conclusions, irrespective of any civil or criminal questions.

In order to meet these objections, M. Devergie suggests that there should be three grades of public official experts, liable to be called upon by the judges, mayors, justices of the peace, prefects and sub-prefects: the first to be attached to the *Cour d'Appel;* the second to the tribunals of each *arrondissements;* the third, to the local courts of the *cantons.*

It has also been proposed by M. Barse, that a college of experts should be established, to which reference should be made in all difficult cases, and in which institution he considers that society would have all the guarantees it could require for the unbiassed and exact application of science to all medico-legal questions, while experts themselves would acquire increased confidence in their conclusions, from the weight and dignity with which they would be invested as the reports of the college. M. Barse proposes that the institution be divided into two sections, chemical and medical; directed by president, vice-president, secretary, etc., chosen from its own body. Every investigation to be submitted to not less than three members of this college. The proceedings of the college to be published at regular intervals; the council having authority also to publish original articles by any members of the college.

The "reports" which have been mentioned as "administrative reports," are those which relate especially to matters affecting the public health. They call for as much care and exactness as is demanded for the preparation of criminal reports, inasmuch as the comfort or even the existence of many individuals or of a neighborhood may be involved therein. The duty, obviously, should not be undertaken by those who do not possess the requisite knowledge of chemistry and manufactures. In large towns, these functions are performed by the Councils of Hygiene and Salubrity.

England.—The duties and qualifications of the English "Officers of Health" are now generally known. They are of no light character; they are not restricted to any narrow or special field of sanitary quackery; but will demand a practical knowledge of medicine, and something more than a superficial acquaintance with collateral sciences. Sir B. Hall has well summed up these in the following remark to a deputation that waited upon him to learn his views on this subject:

"He desired the appointment of men of such high position and acknowledged qualification that, in case of a return of epidemic, they might meet as a general medical council for the whole metropolis, and draw out a system of sanitary regulations which, bearing the authority of their names, would be universally respected."

The combined weight of the experience and attainments of the Officers of Health would not only, in the time of danger referred to by Sir B. Hall, but at all times, constitute such a general medical council as shall be "universally respected." From the close connexion of this council with the central council of vestrymen, the necessity for other non-medical Boards of Health would cease. All their functions would be absorbed by the more efficient medical council.

The Boards of Health that have existed hitherto have been proved to have been powerless for the removal of causes of ill health; the law was indefinite, and the determination of nuisances prejudicial to public health depended upon the views of persons incompetent to form conclusions thereon, while decisions could be reversed by appeals to higher courts of judicature. The whole of our sanitary legislation has been a tissue of uncertainty and doubt. The new Metropolis Local Management Act removes much of the complicated machinery that stood in the way of the application of remedy, and by the formation of a corps of scientific and trained health officers, has paved the way for the attainment of certainty, and has given confidence in the beneficial operation of our sanitary regulations.

An association comprising all officers of health, and others interested in the advancement of sanitary and medico-legal science, would doubtless prove a powerful means to this end. We have now all the elements for the formation of a British society of experts, analogous to the college proposed by M. Barse. Experience is yet wanting to most of the newly-appointed officers of health, but as this is accumulated, if it be enlarged and corrected by comparison and discussion, the result must be that greater precision will rapidly be attained, and the public proportionately inspired with confidence in the opinions of those to whom they have entrusted those hygienic and medical affairs which alone can be safely confided to professional hands. It may be hoped that an association of this nature will ere long be in course of formation.*

Thus, besides the duties immediately of a sanitary nature, the medical

* The metropolitan medical officers of health have recently formed themselves into an association.

officers of health will eventually be looked up to as the most trustworthy aids to the coroner in the prosecution of medico-legal inquiries. Such assistance is absolutely needed in most law courts, as well as the coroners' court. The irregularities and oversights now too frequently occurring before the coroner's tribunal would, under such circumstances, be much less likely to occur. The progress that would be made in the diffusion and improvement of medico-legal science, by the greater certainty and facility that would be afforded for the detection of crime, would have the effect of deterring from its perpetration. It may seem superfluous further to allude to the need actually existing for improvement of the coroner's court in England. But a still more lamentable want of a medical jurist is to be found in Scotland. The coroner's court does not now, although it did anciently, exist in Scotland. The following is the practice of inquests in that portion of the United Kingdom, as stated by Mr. Craig; it is very different to the practice in England or Ireland, where direct application to the coroner may at once obtain an inquest, if there be ground of suspicion :

"1st. In all cases of sudden death, the district constable repairs to the place where it has occurred, collects information, and sends off a report immediately to the superintendent; and, in cases of rape, child murder, or concealment of pregnancy, the *constable* is to ascertain, with precision, all appearances exhibited, such as marks of feet, blood, etc., etc. If there be any circumstances calculated to raise ground of suspicion as to the death, such as external marks of violence, bruises, fractures, etc., the constable is to apply to the nearest medical man without delay, and, after an examination, is to obtain a certificate, and forward it immediately to the superintendent. In all cases of serious assault, and where death is likely to occur, the constable, without delay, procures the assistance of the nearest medical man, and sends off a report, as before described; and instructions are given as to what circumstances the medical man is to certify. Upon receiving such a report, it is laid by the superintendent before the procurator-fiscal of the county, who either acts upon his own responsibility, or occasionally takes a fresh precognition, and prepares a case to submit to the crown-agent, to whom the police reports are also frequently sent, and whose instructions are thereafter acted upon."

The "Procurators-Fiscal" are legal officers appointed by the Government to each county, their duties being to inquire into alleged crimes, to receive the reports of the police, and to determine whether prosecution shall be undertaken. In the event of a trial, the medical attendant of the person to whom violence or accident has occurred is required to give evidence and assist the court by his opinions. Should the condition of the person so injured be supposed to be such as shall endanger life, the procurator-fiscal may require that the police medical officer shall visit and examine into the state of the health of the person, in order that he may report whether he is in a fit state to "emit a declaration," or make a statement of the circumstances attendant on the accident or violence, to the sheriff, in order that important evidence may not be lost by the death of the injured.

Some change is evidently demanded where the initiation of an inquiry involving questions of life or death is dependent upon the caprice or conceit of a parish constable. No stronger proof could be afforded of the importance of medical knowledge in the institution of inquiries touching the causes of death, than is afforded by its total absence in this instance beyond the Tweed. So protective to criminality is the existing order of things, that Mr. Craig, in his very striking pamphlet, informs us that it was a matter of discussion among the servants of a family whether it was better to have a bastard child in the town or in the country; they came to the conclusion that a child is more easily disposed of in towns. Surely it is high time that the practice of the English laws of coroner, registration, and medical officers of health, should be extended northward. Mr. Craig relates an instance also of the deaths of both child and mother after the obstetric administration of chloroform, and interment without inquiry. While we congratulate ourselves that such occurrences can scarcely take place in England, we regret not only the impunity it offers to crime or rashness in Scotland, but we also regret the confusion it necessarily introduces into the statistics of the results of any novel or hazardous line of practice.

The appointment of a Public Prosecutor has repeatedly been spoken of, and the proposition had so far assumed a definite form, that early in 1854, a bill was introduced into the House of Commons by Mr. Phillimore, for the express purpose of creating public officers under this name. The bill meanwhile was withdrawn, upon assurance given by the Attorney-General that he had been requested by the Government to prepare a measure having the same object. This bill, however, so far as we are aware, has not yet been brought under the notice of the legislature.* Its principal features were such as to promise much improvement upon the present mode of proceeding. The bill proposed to divide the country into districts, with a public prosecutor for each, whose functions would resemble those of the *Procureur Impérial* in France.

That the introduction of this functionary into our system of criminal jurisprudence would be in the highest degree advantageous, none but those who have a personal interest in existing arrangements can doubt. Aided by the counsel of officers of health, or by those eminent medical jurists which it is the honor of Great Britain to possess, the jurisdiction of civil and criminal courts would cease to furnish so many examples of prosecution carelessly conducted, evidence destroyed or overlooked, and guilt escaping.

From the preceding remarks, it will be seen that, in many of their most essential and most useful features, the new officers of health approximate to the German *physici*. The French system of the administration of hygiènic affairs, resembles the functions and powers of our English boards of vestrymen under the new Metropolitan Local Management Act. The extension of the principles of this legislation to other towns will complete the resemblance, and extend the operations of so beneficial a law.

* While writing these observations, the Report of the Select Committee of the House of Commons recommending the appointment of public prosecutors, is published. 'The Times,' May 29th.

As it is among the German *physici*, and among the medical members of the French Councils of Hygiène, that forensic medical science is sought and fonnd, so it must eventually come to pass that the medical sanitary officers of England will constitute the body in which medico-legal sciencc will be most assiduously and most successfully cultivated. The sanitary and the forensic dutics of officers of health are closely associated—the qualifications which fit them for the performance of the one especially adapt them to thc reqnirements of the other. As, by the new act, the British legislature is expressing a just appreciation of the scientific attainments of the medical profession, and regarding its members as the only trustworthy advisers in all questions affecting public health, it must of necessity follow that public opinion will concedc the highest respect to the opinions given in courts of justice, by an experienced body of scientific *experts*, upon all medical qnestions involved in criminal or civil jurisprudence.—*Brit. and For. Med. Chir. Rev.*

Art. XIV.—*The Quarantine Convention at Philadelphia*, May, 1857.

While the last sheets of the New Orleans Medical and Surgical Journal were passing through the press, late in June, *The Medical News and Library*, of Philadelphia, for June, came to hand, containing "Minutes of the Proceedings of the Quarantinc Convention," from which it appears that "the two propositions" which have been already commented on in the first article of the present nnmber of the N. O. Med. Jour., and which *passed unanimously* on the 14th of May, were reversed, or rather "*indefinitely postponcd by an unanimous vote*" on the 16th or last day of the convention.

These weighty postulates are:

1. Yellow fever is not contagious, *per se*.

2. That it is only propagated in a foul or infectious atmosphere, analogons to that which gave it birth.

These "two propsitions having been adopted without discussion, the qnestion on their adoption was, on motion of Dr. Hayward, of Boston, reconsidered." And lo! the facts, criteria, and generalizations of experimental philosophy which were *unanimously* inaugurated on the 14th of May, vanish before the *unanimous* vote of the 15th! *See-saw!* "a play among children, in which they sit on cach end of a board and move alternately up and down."

The following propositions were at length adopted, though not unanimonsly:

1. There are certain diseases which may be introdnced into a community by foul vessels and cargoes, and diseased crews and passengers.

2. These diseases are smallpox, and, under certain circumstances, typhus fever, cholera, and yellow fever.

3. When the latter diseases are introduced in this manner, their action is limited to individuals coming within their immediate influence, and cannot become epidemic or endemic, unless there exist in the community the circumstances which are calculated to produce such disease independent of the importation.

4. That the circumstances alluded to, consist in vitiated states of the atmosphere, from local causes, in connection with pecnliar meteorological conditions.

5. Efficient sanitary measures, including quarantine, will, in most cases, prevent the introdnction of these diseases, and may at any rate disarm them of their virnlence, and prevent their extension, when introduced.

6. The present quarantine regulations, in operation in most of our States, are inefficient, and often prejndicial to the interests of the commnnity.

7. Disease may be introduced; 1st, by a foul vessel, especially when proper measures are not taken to keep the hold free from stagnant and pntrid bilge-water; and more particnlarly when there exist in the hold droppings or drainage from pntrefiable matters which are allowed to penetrate and remain between the timbers of the ship. 2d. By cargoes consisting in whole or in part of rags, cotton or like porons snbstances, shipped from ports at which any malignant epidemic or endemic disease of a contagious or infections character prevailed at the time when the vessel was loaded. 3d. By the filthy bedding, baggage, and clothing of immigrant passengers, particnlarly when these are crowded together in insufficient qnarters, although the passengers themselves may be free from any actual disease. 4th. By the air that has been confined dnring the voyage in closely sealed and ill-ventilated holds. 5th. By squalid and diseased passengers landed and crowded together in unhealthy neighborhoods, or in small and ill-ventilated dwellings. 6th. By passengers and crews, who are actnally laboring under, or infected with any positively contagious disease, their bedding, clothing, and baggage.

8. To prevent, therefore, the introduction of disease from the several causes ennmerated, the necessity is apparent of providing a system by which all parts of a vessel may be ventilated during a voyage; and for the careful inspection of all vessels immediately upon their arrival, and before they are allowed to come up to the wharves of a city, for the landing of their passengers and discharge of their cargoes. No vessel, arriving between the 1st of May and the 1st of November, should, in fact, be admitted to a port, until her hold is freely and fully ventilated, nor until the bilge-water is entirely removed.

9. Provision should be made for the immediate landing of all those portions of the cargo of a vessel, and the baggage and clothing that may be judged capable of generating or communicating disease, and for their proper purification, at such places and under such regulations as

shall preclude all danger of their exerting a morbific influence, either immediately, or upon their subsequent admission into the city.

10. Provision should be made also for the immediate landing of all such persons from on board of vessels as they arrive, and their due and comfortable accommodation and treatment, until such time as they can be taken charge of, and properly cared for by their friends.

11. In the case of a ship-load of squalid passengers, or those strongly predisposed to disease, their clothing, beds, and other effects, should be at once subjected to a thorough ventilation and purification; and, upon their landing, adequate measures should be adopted to prevent them from crowding together in confined, unhealthy, and ill-ventilated dwellings and localities.

12. When a vessel arrives in a particularly foul condition, or on board of which disease has prevailed during the voyage, after her crew and passengers have been removed from her, she should be subjected to a thorough process of cleansing and purification, for which purpose it may be necessary to discharge her cargo at a safe distance from the city, and to allow only such portions of it to be conveyed there as are incapable of creating disease, the residue being subject to ventilation in such a manner as shall prevent it from suffering damage and all unavoidable deterioration.

13. The carrying out of these provisions should be intrusted to a single officer, with such assistants as may be required to facilitate him in the execution of his functions.

14. This officer should be a regular physician, of unquestionable talents and experience, and possessed of great decision and rectitude of character.

15. His compensation should be sufficiently ample to enable him to devote his entire attention and energies, throughout the year, to the duties of his office.

16. While the power of removing him for incompetency, neglect, or other adequate cause, should be vested in some competent tribunal, his appointment should be based solely upon his capacity to fulfil satisfactorily his incumbent duties, and his continuance in office made dependent upon his faithful and skilful discharge of those duties.

17. To this officer should be intrusted the sole and entire decision, under certain general provisions established by law, as to the treatment required in the case of each vessel that shall arrive, and of its cargo, crew and passengers, and to place it and these in a condition to prevent any danger of the introduction by them of disease, he, at the same time, being held to a strict accountability for the manner in which the discretionary power thus confided to him, is executed.

18. As in every community a Board of Health is necessary to watch over its sanitary condition, and to prevent or remove all domestic sources of disease, this body would appear to be the one in which the power of appointing, and the general supervision of the official conduct of the quarantine physician may, with the greatest propriety, be invested.

19. In order to procure a uniformity in quarantine regulations throughout the several ports of the United States, the assembling of

another, and probably several conventions similar to the present one, will be required.

20. To provide for the assembling of such a convention in 1858, it is suggested that the President, Vice-Presidents, and Secretaries of this convention, with a committee of one member from each State represented, be continued after our adjournment, as commissioners for the purpose of taking the necessary steps for the call of a convention next year; provided, however, that their powers shall cease immediately upon the assembling and organization of the convention of 1858.

21. A thorough examination should be made of all immigrants on their arrival, and if they are not protected against smallpox, they should be vaccinated.

22. We recommend that there should be attached to our Board of Health and quarantine establishments stations for minute meteorological observations and vaccine establishments; and that records of these be published at stated periods for the public benefit.

23. We advise the introduction of increased comforts for seamen and passengers, and the ventilation and purification of vessels by a more effectual method.

Signed, HENRY F. ASKEW,
Chairman of the Committee on Business.

On motion of Dr. Condie, it was

Resolved, That the vote of each delegation on the adoption of the Report of the Committee on Business be entered on the minutes.

The delegations voting in the affirmative were: Massachusetts—Boston Board of Health, Boston Port Physician (External Health), Boston Marine Hospital (Internal Health); Rhode Island—Providence Board of Health, Providence Medical Association; New York—Board of Health; New Jersey—Newark Board of Health, Camden Board of Health; Pennsylvania—Philadelphia Board of Health, Philadelphia Board of Trade, Philadelphia College of Physicians, Philadelphia County Medical Society; Delaware—Wilmington Board of Health, Medical Association of Wilmington; Maryland—Baltimore Board of Health, Baltimore Board of Trade, Baltimore Medical and Surgical Society, Baltimore Pathological Society. Those who voted in the negative were: Virginia—Norfolk Board of Health, and Norfolk City Council. The delegations from the Common Council of New Orleans and the New Orleans Board of Health reported each a tie vote.

"The *peculiar* meteorological conditions" which cause disease, as mentioned in the fourth proposition, are not pointed out. These assumed conditions, however true, have never been proved. All that is known of these "*peculiar* conditions" is that they sometimes coincide with and sometimes exist without epidemics.

In vain does the practitioner look in these resolutions for the practical methods of purification recognized as the essential part of quarantine, namely, disinfection, fumigation, etc. Even the *forty days* are not mentioned, much less determined. Perhaps the cargo of few vessels not loaded with the precious metals, would pay the expenses of forty days' detention and a thorough disinfection *secundum artem.*

The first and second propositions which enumerate the importable diseases as four, namely, smallpox, typhus, cholera, and yellow fever, ignore measles, scarlatina, ophthalmia, puerperal fever, whooping cough, dysentery, plague, leprosy, which latter are generally supposed to be quite as contagious as yellow fever, typhus, or cholera.

It is not necessary to allude to the fossilized truisms concerning "cleanliness, ventilation, filthy bedding, crowding, squalidity, baggage, drainage, bilge-water, rags, *cotton*, and like porous substances, bad air, and clothing that may generate or communicate disease," all of which have been denounced as nuisances *ad infinitum* ever since the beginning of the historic æra, and even perhaps ante-date mummification, monuments and Pharaonic pyramids.

The remaining space in this Journal will not permit of an extended examination of the postulates above mentioned, which being for the most part truisms, contain, nevertheless, a stratum of the incomprehensible. Take an example of both: The convention says (1) certain diseases may be imported; that is, smallpox, typhus, yellow fever, and cholera (2); and (4) "that when introduced in this manner, their action is limited to individuals coming within their immediate influence."

Did any one ever suppose that these diseases could exist otherwise than among *individuals?* or that an "influence" can act where it is not? But the convention says that these diseases thus introduced among *individuals*, "cannot become epidemic or endemic, unless there exist in the community the circumstances which are calculated to produce such disease independent of the importation."

"*Cannot* become epidemic or endemic!" Is not this an unwarranted assertion, *a petio principii?* Whether cholera or yellow fever be contagious or not, no one is certain from meteorology or any known atmospheric change that typhus, yellow fever and cholera "*cannot* become epidemic or endemic." Again, the convention asserts that these diseases cannot extend unless there exist in the community that which produces these diseases "*independent of importation.*"

All places not having "the peculiar meteorological conditions," which, by the way, are unknown, can have these diseases neither endemically nor epidemically, even though imported—an assertion which, coming from contagionists, reduces to zero the efficacy of quarantine laws. Places having, independently of importation, all the elements causing these diseases within themselves, can have very little use for quarantine.

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Seeing that there are communities, not yet proclaimed, which are fully competent to produce these diseases, independently of importation, they must suffer from the same epidemically or endemically, always "limited to individuals," be they many or few. The locality which has the absolute and independent power to produce diseases "limited to individuals," may augment its list of cases, *ad infinitum*. Having found the essential cause (*vera causa*), to look for another, namely, importation, is unphilosophical, because unnecessary.

ART. XV.—*Syphilization.**

Two or three years ago a bold young French physician startled the grave deliberations of the *Patres Conscripti* in the French Academy of Medicine, by the announcement of his having discovered a new method of the treatment of syphilis, with which he proposed to extirpate that wide-spread malady from our nosology. Not only did Auzias Turenne aim at the cure of syphilis in persons already affected with the disease, but he shocked morality by the proposal to render individuals hitherto untainted with syphilis totally unsusceptible of the venereal virus. The French Academy of Medicine met, and an acrimonious discussion ensued. The moral and hygienic objections seem to have been those which were discanted upon; the facts do not seem to have been very carefully inquired into; no experiments were made to test the truth or falsehood of the new mode of treatment, and under the powerful influence of Ricord it was rejected by the Academy, in spite of the protest of Malgaigne and others against this summary decision. In this country, the subject seems to have excited very little interest. One or two journals briefly alluded to it in terms of unqualified condemnation, and the only notice of the controversy from an impartial point of view is given in "Ranking's Abstract of the Medical Sciences," p. 333, vol. xvi., by Dr. Radcliffe. Since then, with the exception of two papers by Victor de Méric, in the "Lancet" for 1853, no notice has been taken of the subject, and the medical public in this country seem to regard the question as finally settled by the fiat of the French Academy. Not so, however, our brethren on the continent. In Norway, in Sweden, in Turin, and elsewhere, the bold empiricism of Auzias Turenne has been carefully put to the only test capable of deciding the question at issue—viz., that of experiment. Not content with merely declaiming against syphilization as unheard-of and unjustifiable, Professor Boeck in Christiana, Danielson in Bergen, Carlsson in Stockholm, and Sperino in Turin, have for some years past been engaged in a series of careful experiments and observations to determine the truth or fallacy of Turenne's

* This article, so extraordinary in its facts and doctrines, consists of brief extracts, which, however, will be sufficient to develop the fundamental, and it may be added, almost incredible principles recently deduced from numerous experiments made by a gentleman of distinguished reputation and reputed competency.—ED.

practice. It is plain that experiment alone can decide the question; theory here is but of little avail, and would be of no more use in disproving stubborn facts—if such they really be—than if it were directed against the efficacy of mercury in primary syphilis, or of quinine as an antidote to ague. The French Academy seems to have rejected the practice of Turenne without putting it to the proof; indeed, as we observed before, the moral question alone was tried, and found wanting, while the actual facts seem hardly to have been discussed at all.

Auzias Turenne, a young French physician, commenced, about the year 1844, a series of experiments, with the view of testing the validity of John Hunter's doctrines of the non-communicability of syphilis to the lower animals. After many experiments and several failures, he succeeded in producing in monkeys inoculated with chancre matter a disease which had all the characteristics of true chancre. This was at first admitted in the French Academy, but at a later period was denied. However this may be, it is quite certain that a contagious disease was communicated to the poor animals, and that from these it was transferred to rabbits, cats, and horses. The malady was again from these returned by inoculation to the human species, the first trials in this regard having been made by Dr. Robert Weltz, of Würzburg, on his own person. On four separate occasions, Dr. Weltz succeeded in producing an unmistakable chancre on his own person, by inoculation from animals, and this was acknowledged even by Ricord.

While Auzias Turenne was thus engaged in researches on the transmission of syphilis to animals, he became aware of the curious fact, that each succeeding chancre produced by inoculation became less and less in each animal, until at length a period arrived when inoculation apparently lost all its power, and no chancres or sores of any kind followed the application of the venereal virus. From these facts he drew the inference, that by prolonged inoculation with the syphilitic poison, a constitutional state or diathesis was at length produced in which the system was no longer capable of being affected by syphilis. This condition he terms "syphilization," and upon this asserted discovery all the subsequent experiments and peculiar mode of treatment are based. Auzias Turenne and his followers contend that by such a process of prolonged inoculation the system becomes protected for the future against the venereal poison, just as an individual who has had small-pox cannot take the disease a second time. To obtain perfect syphilization or immunity, the individual must undergo constitutional syphilis; but he must be forced rapidly through this disease by repeated inoculations, in order that it may not injure the constitution.

The abortive experiments of Diday in 1849 require but little notice. He proposed to inoculate with blood drawn from a person laboring under tertiary syphilitic symptoms, so as to prevent, as he imagined, the poison from entering into the constitution at all. Although this proposal was apparently based on one of Ricord's supposed "laws"—viz., that constitutional syphilis never affects an individual but once in his lifetime, it was also in direct contradiction with Ricord's positive opinion, "that tertiary syphilis could not be communicated by the parent to the child."

After a series of experiments, Auzias Turenne's doctrines were laid before the French Academy of Medicine (November 18th) in 1850; and, as might be expected, opinions so novel and so startling met with the most vehement opposition. Turenne had, it seems, only recently commenced at that time his experiments on syphilization in the human subject; he had, therefore, few or no data for the support of his opinions, and he not only proposed to employ syphilization for the primary and secondary forms of venereal diseases, but suggested the use of this treatment as a prophylactic against the contagion of syphilis in persons as yet untainted with that malady. It was upon this latter point that the discussion mainly turned, and here the indignation of his opponents was unbounded at the audacity and immorality of such a proposal. We cannot deny that they had right on their side; the proposal was not only immoral, for the disease is one to which an individual voluntarily subjects himself by a lapse from the rules of morality, but it was also most injudicious to subject a perfectly healthy person to the danger of incurring a malady from which he might never again be able to free himself. The true mode of determining the question—that of experiment, carefully conducted and often repeated—was not adopted, and an application by Turenne for leave to prosecute his researches in the Hôpital St. Lazare was negatived by the Commission. Hitherto, not being permitted to pursue his investigations in a hospital, he had only experimented on a few cases in private practice, and these were necessarily too few and too scanty in the details to be implicitly relied upon. The real question at issue, that of the reality or non-reality of syphilization, was left untouched. Malgaigne, Depaul, and others, in vain protested against the sweeping condemnation of these proposals before the truth or falsehood of the doctrine had been determined by experiment; the great influence of Ricord and his partisans prevailed, and the proposals by Auzias Turenne were unequivocally condemned. Shortly after, a strong case appeared in favor of the opponents of syphilization, in the person of a Dr. L——, who had allowed himself to be inoculated to produce syphilization, and was now covered with venereal sores. While matters thus proceeded in Paris most unfavorably for the advocates of syphilization, the question was being investigated on a large scale, and in a more complete manner, by Sperino of Turin. This physician had great advantages for the prosecution of his researches, as he was attached to the Syphilicoma, or Venereal Hospital, of the city of Turin. He had long remarked that large suppurating buboes healed more rapidly when their syphilitic character was tested according to Ricord's plan, by inoculation of the surrounding parts; and, moreover, that when the primary chancres were large and obstinate, the inguinal buboes were smaller and less freely developed. The longer the local disease lasted, the less chance there seemed to be of constitutional syphilis. Sperino made his first report on the subject to the Medico-Chirurgical Academy of Turin on the 23d of May, 1851. In this report he gives the full details of fifty-two cases treated by him in the Syphilicoma of that city. If Sperino was not the first to employ syphilization for the cure of venereal disease in the human subject, he at all events first performed a regular series of experiments and observations to test the truth or fallacy of Turenne's doctrines.

"The subjects of M. Sperino's experiments were fifty-two hospital patients, all prostitutes, and all suffering from aggravated forms of primary or secondary syphilis. The virus was taken from the person syphilized, or from a comrade—from the first if possible. The inoculations were repeated once or twice a week in three or four distinct places, usually in the abdomen. The time required for the establishment of the artificial chancres was from two to three days. The effects of the second inoculations were less serious than the first, the third than the second, the fourth than the third, and so on, until the virus ceased to produce any effect whatsoever; contemporaneously with which epoch all former ulcers had healed, and buboes, recent nodular enlargement of bones, and cutaneous stains or blotches, had either disappeared altogether, or were rapidly going away."

The virus also, which made no impression at that time, was found to retain all its virulence when tried on an unprotected person.*

Sperino's observations were confirmed by similar results obtained by Dr. Gamberini at Bologna, and by Gulligo at Florence. The report of the Commission appointed in this case, as at Paris, was unfavorable, but it did not extend to the prohibition of further experiments, and Sperino has ever since followed up this treatment in the hospital under his charge. In 1853 he published a detailed account of ninety-six cases of syphilization in a bulky volume of 903 pages. * * * *

Not only are certain cases ill fitted for syphilization from previous mercurial treatment, but the state of health of the patient must be taken into consideration before submitting him to this prolonged and painful treatment. Dr. Boeck advises that we should not syphilize when any inflammatory diathesis exists in the system, as in such cases the artificial chancres may take on a malignant action. Habitual spirit drinkers, and persons of very weakly constitution, should not be subjected to this treatment. The bowels should be regulated, and the digestive organs should be brought into good order; but it is not necessary to enforce any strict rule of diet. In the hospitals of Bergen and Christiania, the ordinary full diet of the hospital was always allowed. With regard to obtaining the patient's consent to the treatment, no difficulty seems to be found either in the Scandinavian or the Italian hospitals. Both Sperino and Dr. Boeck mention the readiness with which patients submitted to, and even sought for the mode of cure which they had seen to be so successful in their fellow sufferers.

Various methods of inoculating the venereal virus have been adopted by the advocates of this system. Auzias Turenne at first kept up a succession of single chancres; while Sperino made three or four separate inoculations at once, and repeated these two or three times in the week. After having in this way reached the number of twenty-four or thirty inoculations in all, he found that the chancres last produced were exceedingly small, and he then diminished the intervals, and made more inoculations at each sitting. He found that the first chancres were deeper, larger, and more inflamed than those which succeeded them; and that

* See Dr. Radcliffe's Report on Surgery; Ranking's Abstract, vol. xvi., p. 334.

by diminishing the intervals and increasing the number of inoculations, the earliest chancres visibly diminished, and were less painful and inflamed. To test this still further, Sperino ventured upon as many as sixty inoculations at once upon the same individual; but the result obtained was that *immunity* to further inoculation set in before the syphilitic symptoms were cured, and relapses of the disease frequently ensued. He therefore returned to his former plan, and now inoculates for six to ten chancres at each sitting. While these chancres are progressing, it is neither necessary nor advisable to inoculate afresh, nor should this be done until the former chancres are developed. Should the chancres be developed too freely, and threaten to produce active inflammation, or to extend as phagedænic sores, he checks their progress by inoculating afresh at shorter intervals.

The practice of Dr. Boeck differs very little from that of Sperino. At first, afraid of producing too serious an impression upon the system, Dr. Boeck inoculated for two chancres only every six days, selecting that period of time because he found from experience, that it required about five days to produce induration in a chancre; although he does not, as we have already seen, consider this latter circumstance absolutely essential. Subsequently he has shortened his intervals to three days, and increased the number of inoculations to eight or ten. Less time is thus required to produce immunity, but Dr. Boeck has a wholesome distrust of those cases which are pushed too rapidly through their course of syphilization.

With regard to the most favorable points in the body for inoculation, Sperino placed his punctures on the lower part of the abdomen, while Dr. Boeck prefers inoculating on the arms and thighs. Accompanying each of his observations in the volume before us is a lithographed outline plate of the human figure, with the points of inoculation, and the date of each; while lines drawn from the arms to the thighs enable us to follow the transpositions of the virus from one chancre to another. By this simple figure it is easy to trace the progress of the treatment, to see the number of inoculations at each sitting, and the source from which they are derived. * * * * * * * *

We think that the advocates of syphilization have established a claim on the profession to a fair trial of their system. It is evident that its employment is not fraught with danger, as is the case with so many remedies proposed from time to time; and the investigation of the subject seems to open up a new field for the further study of one of the most malignant and most lasting and destructive poisons that affect the human frame.—*Brit. and For. Med. Chir. Rev.* for April, 1857.

Professsor Boeck on Syphilization.—If it be evident, as I think it is, that the remedies hitherto used against syphilis are uncertain, and even pernicious, then it is not only allowable, it is our duty, to try the new one that is offered to us. To me the only question was—in what cases syphilization might be used. I have already mentioned that I always thought *prophylactic* syphilization to be an absurdity. Therefore, I shall not dwell any longer on it. The question is—whether syphilization ought to be used in all cases where syphilis exists? This question is easily answered. I cannot predicate with certainty if all those who get primary syphilis will get constitutional disease. The simple chancre is not in general accompanied by any constitutional affection. The Hunterian one is certainly a consequence of a constitutional syphilis, but we may easily deceive ourselves in respect to the induration. Therefore, I never use syphilization where there is merely primary syphilis. It is not until the constitutional symptoms have appeared that I consider this method allowable, for then I am convinced that I do not introduce anything into the organism but what is there before. I cannot double a malady already present. So I am quite certain not to do any harm to the patient.

This may be the fit place for mentioning shortly how I produce syphilization. Without any other preparation than a bath, or in my private practice even without this, I apply on each thigh, and on each arm, or on the sides only, three inoculations in every one of those places, with matter taken from a primary ulcer, or from an artificially produced one in a person who has been syphilized. I choose the first named places for those who are lying in the hospital, but I inoculate the sides of those who, during syphilization, are going out attending to their business. However, I must add, that I never confine my inoculations exclusively to the sides. If they do not prove effectual there, I apply them on the thighs, on which we shall almost always find the ulcers to be larger, deeper, and of a longer duration. Therefore, I think this place the best, and never fail inoculating there. Every third day I inoculate anew. As long as the last inoculations produce pustules, I take the matter from these. In some cases I have always tried to take the virus from the first made inoculations, thinking to find there the strongest matter, and thereby, perhaps, be able to achieve the cure in less time; but the cases in which the treatment has been accomplished in this manner are so few, that I should not venture to draw deductions from them. In syphilized children, I have only applied one inoculation on each thigh, and generally also on each side, every third day, or perhaps at longer intervals. The ulcerations produced in this manner may occasionally become phagedænic in grown-up persons. Many wounds may be united into one, and form a large ulcerating surface. This, however, does not signify in the least, provided the treatment be continued without being alarmed. The inoculations are a certain remedy against the phagedænic ulceration. In children, the ulcers are generally so small as not to cause any inconvenience. It is only in cases which have been mercurialized before that I have sometimes seen the artificial ulcerations enlarge, yet never to an alarming degree.

In some instances the inoculated person becomes proof to one sort of virus. I then take the matter for inoculation from another, preferring a case which has had a different origin; this then proves effectual. But sometimes they become proof to this also, and I then seek for a third source; and thus I go on as long as any matter at all will operate.

Moreover, it is worth noticing that immunity does not occur, and the syphilitic phenomena do not vanish, earlier in children than in grown-up persons. The time necessary to produce immunity is about three months. However, it depends upon the number of inoculations that may be employed--upon the symptoms that have taken place; and in children it seems to depend upon their syphilis having been acquired or inherited. The quality of the virus even may not be without influence. When immunity is attained, the syphilitic phenomena generally vanish. However, should this not be the case, it should cause no uneasiness, as they will certainly vanish within a short time, without any remedy being used.

It is not uncommonly the case, that during syphilization a new eruption takes place; but this always exhibits symptoms of the same nature as were observed at the beginning of the process of syphilization. These eruptions need not cause any anxiety. The operator may quietly go on inoculating, and things will proceed as in other cases. One phenomena that I have often seen develop itself under syphilization is iritis. This has been very intense in some cases; but I do not make it the subject of any special treatment, either antiphlogistic or derivative, and the result has hitherto been always favorable.

The syphilitic poison does not run a rapid course, as was known a long time before we heard anything of syphilization. We often see the constitutional symptoms not to show themselves until after some months. Therefore, there is nothing astonishing in the fact, that the curative results of inoculation do not show themselves until after some time.

But if even by syphilization alone we cannot affect a cure in all cases, it is, nevertheless, an indispensable remedy. Patients who have been nearly destroyed by syphilis and mercury may be restored by it to health. The cases belonging to this class may present very different aspects, and the effect of syphilization on them, of course, also different. I therefore think the best way to give my view of the matter is to arrange them in separate groups, viz.:

1st, The early constitutional cases recently treated with mercury, in which the same symptoms have reappeared. Here syphilization will, in some cases, produce as certain an effect as in cases not treated before, but we oftener find some irregularity. The phenomena vanish and return again. That which I have said takes place in the individuals not mercurialized is repeated here; namely, it is always the same forms which existed at the beginning of the syphilization that return.

2d, The affection may be still confined to the cutaneous system and the pituitous membranes, but the tubercular forms may be predominant, ulcerations on mucous membranes may go deeper, or the affection may be in the subcutaneous areolar tissue. We may even have the *tubercular serpigenous syphilide.** These affections are more slowly acted upon. The reason for this may partly be found in the fact, that these forms are often rather of old standing. Mercurial treatment, iodine, etc., have been used against them, and we also often see bad forms show themselves within a year after the primary affection. This seems to depend on individual constitution, for it often has no relation to the quantity of mercury, or the care taken of the patient during the treatment.

If, in these cases, new eruptions come out during syphilization, we shall always find them to be more superficial than the earlier affection, if even they have the same form as that which existed at the beginning

* Radesyge.

of the syphilization treatment. It happens in these cases, especially, that the inoculations, after a small number of them have been made, do not produce any effect, then we must give iodine, after which we shall again have larger pustules and ulcers.

3d, Affections of the osseous system. Here syphilization hardly ever seems to produce any effect. But when iodine has been used earlier, producing results of only a short duration, then syphilization, united with iodine, seems to relieve the nocturnal pains more certainly; but osseous tumors remain unaltered by syphilization.

4th, Affections of the nervous system—hyperæsthesia and incomplete and complete paralysis—may occur: First, in combination with other syphilitic symptoms, and in those cases I have seen them diminish under the influence of syphilization. Secondly, they may be the only phenomena left as the result of the mercurials used against the primary syphilis; and, under these circumstances, we see little or no effect from syphilization. However, I must observe, that all the cases of that sort which I have hitherto treated have been of old standing, and have for a long time been treated with iodine, etc.

5th, Mental maladies, finally, may be the result of the mercurial treatment. I have had no opportunity of employing syphilization in such cases, but I consider it well worth trying. The idea that syphilization should be the last refuge, seems to be quite as if quina should not be given in the beginning of an intermittent, but that the system should be first injured by different other medicines, and then quina given afterwards.

As the result of the great many observations made with syphilization, it seems sufficiently proved that the syphilitic virus heals constitutional syphilis, and that it cures the malady without doing any harm whatever to the organism. On the contrary, we see that the uneasiness, the rheumatic pains which often accompany constitutional syphilis, vanish under continued inoculations.

The immediate effect of syphilization upon the organism is generally also very favorable, but there are some who have thought that it may, perhaps, operate perniciously in future time. To this I have only to say, that I can show many individuals discharged from hospital more than three years ago, who have remained in uninterrupted good health, and that in not one of the persons treated in this manner, can I point out any unfortunate result whatever, which could be ascribed to syphilization.

If, finally, I were to comprehend, in a few words, my opinion about syphilization used as a curative remedy, I should say—

1. Syphilization is undoubtedly useful against syphilis; it is the only certain remedy that we know, and it is not pernicious to the organism: mercury, therefore, ought to be banished as a curative remedy.

2. Syphilization is not so certainly useful against *mercurialized syphilis*, but it ought always to be tried. It often does cure it entirely, and it at least does not fail to do some good in the greatest number of cases.

3. The application of syphilization against other maladies than syphilis ought to be tried with the greatest possible care and exact observation.—*Glasgow Med. Jour.*. April, 1857; from *Dublin Quarterly*.

ART. XVI.—*Indigenous Races of the Earth.* (See catalogue.)

THE *Indigenous Races* is an important work upon Anthropology in what point of view so ever it may be considered. It bears upon its face evidences of extensive research and independence of thought upon the sciences of Ethnology, Palæontology, Archæology, Philology, Craniology, Natural History, etc. A work of this kind was much needed in this Republic. The great works which have been published, or are in course of publication on the continent of Europe, at enormous expense, unfolding the progress of discovery in the East during the current century, have not been republished in this country.

Mr. Gliddon, as a lecturer and writer, deserves much commendation for his industry, zeal and ability, in bringing some of the above named topics prominently before the American public in advance of the two elaborate works with which he has within the last three years been identified as an author, namely, "*Types of Mankind*," and "*Indigenous Races*." The exuberant pictorial illustrations which characterize these works are by a fair hand whose name is not in the title pages: Mrs. Gliddon should be first in the "Types," first in the "Races," as well as first in the hearts of the grateful readers of these volumes. It is of her the publishers of the *Races* say, "that the accomplished lady to whose single pencil four-fifths of the entire series of illustrations herein contained are due, spontaneously volunteered, and for two years employed it." If the dread of being called a learned woman can be surmounted, let the publishers ornament their next edition with a new frontispiece, namely, her portrait.

The reader will see by referring to the catalogue of this journal that the "Indigenous Races," the joint production of MM. Maury, Pulszky, Meigs, Nott, and Gliddon, is a large work upon diversified topics of high import to the student of humanity—of humanity not as displayed in its external transactions in cabinets and battle fields. These phases of man's past history, the poet and the historian, appropriate to themselves in a fashion somewhat illusory, while they pass by his internal history, his personal and domestic characteristics, his language, mental frame, dominant ideas, cranial and anatomical conformation, varieties, geographical distribution, climatic influences, arts, sciences, literature, monuments, inscriptions, customs, chronology, religion, etc.

At present it is proposed to enter neither upon the examination of the merits nor upon the disputable points of this work. A book of this kind may be invaluable for its facts, documents, and researches, even though its opinions, hypotheses, theories, and explanations, may be unsatisfactory, inconclusive, or even erroneous. For example, Prichard's work on the Physical history of Man, though written to prove his Unity, fails to prove the latter, yet it is just as good for its anatomical and ethnographical *tableaux* and details as if it had proved this postulate. It is not intended to deny the unity because this able author failed to establish it beyond question upon physical principles. In like manner the authors of the "Types of Mankind," and of the "Indigenous Races," may fail to carry complete conviction to the minds of many readers in favor of the opposite doctrine, namely, that of the Diversity of Races, but they have, nevertheless, accumulated in these elaborate works a vast amount of valuable knowledge.

The chronology of these works is, or will be, perhaps, the stumbling block in the way of their acceptance and approval, owing to a seeming antithesis to sacred writings. The latter, however, do not teach this science any more than physic, anæsthesia, chemistry, geology, electrical telegraphing, astronomy, etc. Neither the date of the creation of the world nor that of the creation of man has been fixed, much less referred to and practised upon as points of departure in sacred history. It appears that even the birth of Christ was neither received nor referred to as a chronological æra or method of computing time, until in the sixth century afterwards, (527) when a Roman Monk, Dionysius the Little, introduced it into use. The numerous chronologers who have undertaken to establish the æra of the creation from sacred history, having therein no satisfactory data, have arrived at the most contradictory conclusions. The Eastern or Greek Church differs more than 1,500 years from the Western Churches in reckoning the æra of the creation: according to the former, the creation took place B. C. 5,509; according to Usher, 4,004. Besides these dates three hundred contradictory ones have been advanced by Christians and Hebrews.

The learned authors of "*Types and Races*" have disinterred significant data from the cinders of long extinguished centuries, the *debris* of former worlds. They have gathered inscriptions, documents and skulls from the dark, dank and mouldering realm of the dead—from the frontiers of the remote and mysterious past, and having added thereto their individual experiences and opinions, not omitting those of contemporary investigators, they may well claim an impartial and friendly hearing from all parties, not excepting dissenting critics who can indite difficulties easier than explain them—propound problems easier than solve them—raise objections easier than make laborious explorations and scientific contributions.

The publishers' announcement in the "*Indigenous Races*" reveals a fact which must be very puzzling to individuals who sneer at scientific labor in which money is not the all-powerful motive—a fact which reproaches professors enjoying large emoluments, who neither contribute anything themselves to the cause of science nor encourage others in this behalf, namely, "In justice to the labors of the authors and contributors, we will state, that no monetary compensation is equal to the pains bestowed by each upon his part; and several of the above have kindly furnished their quota without the remotest pecuniary object."

Without expressing any opinion concerning the validity of the unitarian or diversitarian dogma of ethnologists, it may not be improper to enumerate some of the views of the ablest advocate of the unity, namely, the late Dr. Prichard, already alluded to, who spent thirty-seven years of his valuable life in writing five octavo volumes upon this question.

Of the hybridity argument, a fundamental one, Dr. Prichard gives this exposition, namely, "distinct species do not freely intermix their breed, and hybrid plants and animals do not propagate their kind beyond at most a very few generations, and no real hybrid races are perpetuated; but mixed breeds descended from the most distinct races of men are remarkably prolific. The inference is obvious. If the mixed propagation of men does not obey the same laws which universally govern the breeding of hybrids, the mixed breeds of men are not really hybrid, and the original tribes from which they descend must be considered as varieties of the same species."—(i. 375.)

Dr. Prichard quotes and adopts authorities to show that the brains and the minds of the negro and the white are equal.—(ii. 352.)

He maintains that the Indians who inhabit dense, humid forests, are comparatively white, while in dry, open places, they are dark and even black like negroes, instancing the California Indians, who, according to him, are "the almost exact counterparts of the slaves of the negro plantations in the West Indies." These white Indians are found neither in the Delta of the Mississippi nor in the Peninsula of Florida, where the forests are unusually dense and humid. In 1836 about 1,200 Indians from Florida passed through New Orleans, but to the writer they appeared no whiter than Northern Indians.

Dr. Prichard's fifth volume is devoted chiefly to native races of America. His conclusions are: "All the different races belong to one family: there is nothing in the physical structure of these races tending to prove an original diversity from the rest of mankind: that the same is true of their psychology."

As Dr. Prichard's unitarian arguments, both philological and pyschological, are based in a great degree upon the Delaware Indian tribe, the following statement, never before published, is submitted, that the reader may judge for himself as to the validity of these arguments and the authenticity of the facts to which they relate:

In 1818 I visited the Rev. Mr. Heckewelder, long the pastor, teacher, friend and ruler of the *Lenni Lenape*, or *Delaware Indians.* These Indians and their preacher, Mr. H. of the United Brethren Church, lived in a village on the Tuscarawas river a few miles below New Philadelphia, in the State of Ohio. Of the christianization of these Indians glowing accounts had been given. But Mr. H. informed me, that among these people, his parishioners, there was but one man who would not get drunk when an opportunity offered. This sober one, called John, appeared to possess but little intellect, and his associates still less. He recounted to me some of the superstitions which prevailed among the Delawares before their adoption of Christianity. These Indians, who lived in a double row or single street consisting of miserable huts hardly fit for cattle, were, to all appearance, extremely stupid, dirty, lazy creatures. They lounged in the sun, a common practice as I found on subsequent visits, and presented altogether a type of mind and manners of a low grade.

The Rev. Mr. Heckewelder, who devoted his almost entire life to the improvement of these Indians, showed me a spelling-book, a grammar, and portions of the Gospels in the Delaware language, the results of his own benevolent labor.

This gentleman of blessed memory and much learning among the Moravian missionaries, was born in England. He became a missionary in 1771. He settled on the Muskingum or Tuscarawas river in 1797. In 1819 he published a history of the Indian nations who once inhabited Pennsylvania, and during the following year, a narrative of the Moravian mission among the Delaware Indians from 1740 to 1808. He died in 1823, aged 79.

Dr. Prichard in his Physical History of Mankind (v. 299, Lond., 1847,) relies much on the conversion of these Indians as proving their psychological unity with the white race. He also attaches much importance to the Delaware language as proving the unity of races, this language being, according to him, the parent tongue of the two thousand Indian languages of America. This pretended unity running through all these languages is not so extraordinary, however, as his account of the Delaware language itself, in which he finds elegance and a perfection surpassed by neither the ancient nor modern tongues. The Delaware grammar is, according to him, full of art, perfect in its scientific structure, rich and infinitely varied in idioms and roots, and in the inflection of its pronouns, in new combination of nouns, multiform in the conjugation of its verbs, etc. Now all history and common sense show that a perfectly philosophical grammar with a rich and polished language is only found in the highest degree of learning and civilization, attainable in a nation or by a people. The Delawares would be the last people among whom these attainments could rationally be expected.

Dr. Prichard appears to have derived his information concerning the perfection of the Delaware language from an eminent scholar of Philadelphia, the late Mr. Du Ponceau, who doubtlessly got *his* information from Mr. Heckewelder, the amiable and devoted missionary. The latter isolated from the world, might, in twenty years, more or less, have made a grammar for these lazy, unthinking, stolid creatures. Dr. Prichard's philological argument in favor of the unity of the American races, based on this Delaware type of a perfect grammar was doubtlessly the work of Mr. Heckewelder, Mr. Du Ponceau, or some other scholar, and its applications to "the known grammatical analogy of the American languages," (v. 350) afford examples of credulity and inconclusive reasoning unworthy of such great names, and unfit to be transmitted to posterity as true.

Lo! the poor Indian! "At an early period of the existence of Harvard University," says the late Dr. Warren, "our pious ancestors placed there a number of young Indians. These, after a short time of study, uniformerly disappeared, and I believe the name of Caleb Chees-Chaumneh stands on the college catalogue, a solitary instance of a native regularly graduated."

Dr. Prichard quotes from the late Mr. Gallatin of New York, a statement showing that the most remarkable example of Indian improvement known, is that of the Cherokees, and is owing to the introduction of negro slavery among them, there being 1,200 slaves among 15,000 Indians.

In conclusion, it may be asked where is the Delaware tribe now? In a Congressional Document, published by authority in 1845, the following account of the Delaware tribe is given by R. W. Cummins, Indian Agent: "*Christian Indians.*—This is a small band of mixed Indians, Munsees, and a few Delawares. They number 208. They are located on the Delaware land, on the north bank of the Kanzas river, eight or ten miles above its junction. The Missionary Society of Moravians have established a mission among these people." Thus it appears that these Delawares including their fusions with other tribes, numbering but 208, are like the other Indians who come in contact with the whites, hastening to extinction. Civilization is virtually for the unintellectual, prowling, savage hunter, but another word for that irksome, stagnant, non-progressive, deadly torpor, *ennui*, which, including its remedy, whisky, has contributed much as well as bullets and bayonets, to reduce, in two centuries, the red race from sixteen millions (Catlin) to a few hundred thousands.—EDITOR.

Editor's Office.—Notices

JULY, 1857.

Communication from James E. Smith, M. D.

BOOKS AND PAMPHLETS RECEIVED.

Indigenous Races of the Earth; or, New Chapters of Ethnological Inquiry; including Monographs on Special Departments of Philology, Iconography, Cranioscopy, Palæontology, Pathology, Archæology, Comparative Geography, and Natural History: Contributed by Alfred Maury, Bibliothécaire de l'Institut de France; Secrétaire général de la Société de Géographie de Paris; Membre de la Société Impériale des Antiquaires de France, des Académies de Bordeaux et de Caen, des Académies et Sociétés d'Archéologie de Belgique, de Picardie, de Madrid, des Sociétés Asiatique et Médico-Psychologique de Paris, de la Société d'Histoire de la Suisse-Romande et de la Société de Littérature Néerlandaise de Leyde; Chevalier de l'Ordre de la Légion d'Honneur, etc., etc., etc.; Francis Pulszky, de Luboez and Cselfalva, Fellow of the Hungarian Academy; Correspondent of the Instituto di Corrispondenza Archeologica di Roma; late Under Secretary of State in Hungary, etc., etc., etc.; J. Aitken Meigs, M. D., Librarian of the Academy of Natural Sciences of Philadelphia, etc., etc., etc.; presenting fresh Investigations, Documents, and Materials; by the Editors, J. C. Nott. M. D., Mobile, Ala., Geo. R. Gliddon, formerly U. S. Consul at Cairo; authors of "Types of Mankind." Pp. 656, large 8vo.; with numerous illustrations. Philadelphia: J. B. Lippincott & Co.; London: Trübner & Co. 1857. From Mr. J. C. Morgan, bookseller, Exchange Place, N. O.

On the Diseases of Women, including Diseases of Pregnancy and Childbed: By Fleetwood Churchill, M. D., M. R. I. A., author of "Diseases of Infants and Children," "Theory and Practice of Midwifery;" Vice-President and Fellow of the King and Queen's College of Physicians in Ireland; one of the Presidents of the Obstetrical Society; Professor of Midwifery, with Diseases of Women and Children, in the King and Queen's College of Physicians in Ireland; Associate Member of the College of Physicians of Philadelphia, U. S., etc., etc.; a new edition, revised by the author; with notes and additions by D. Francis Condie. M. D., Fellow of the College of Physicians of Philadelphia, etc., etc. Pp. 768. 8vo.; with illustrations. Philadelphia: Blanchard & Lea. 1857. From Mr. J. B. Steel, bookseller, 60 Camp street, N. O.

Medical Education: By Henry Hartshorne, M. D., Professor of the theory and practice of Medicine, etc. Pp. 14. Phila. 1857. From the author.

State Woman's Hospital, N. Y.; 3 documents: from J. Marion Sims, M. D., attending Surgeon. 1857.

Vaporiferous Bath Apparatus, invented by Dr. L. H. Lefebvre. Pp. 12. New Orleans. 1856. From the author.

Knowledge the only Guide to Action: By Professor J. H. Watters. M. D. Pp. 16. St. Louis. 1857.

The Transactions of the Academy of Science of St. Louis, (Missouri.) Vol. I. Pp. 92. 8vo.; with illustrative plates. St. Louis. 1857. From the Academy.

Proceedings of the Academy of Natural Sciences of Philadelphia.

A Manual of Examinations upon Anatomy, Physiology, Surgery, Practice of Medicine. Chemistry, Obstetrics, Materia Medica, Pharmacy, and Therapeutics: especially designed for Students of Medicine, to which is added a Medical Formulary: By J. L. Ludlow, M. D., A. M., Fellow of the College of Physicians; Member of the American Medical Association, and one of the Consulting Physicians to the Philadelphia Hospital, etc., etc.; a new edition thoroughly revised and much enlarged, with 370 illustrations. Pp. 816, royal 12mo. Philadelphia: Blanchard & Lea. 1857. From Mr. J. C. Morgan, bookseller, Exchange Place, N. O.

The Annual Report of the Physician-in-Chief of the Marine Hospital at Quarantine. Pp. 63. Albany. 1857. From E. Harris, M. D.

Catalogue of Human Crania, in the Collection of the Academy of Natural Sciences of Philadelphia, based on the third edition of Dr. Morton's "Catalogue of Skulls," etc.: By J. Aitken Meigs, M. D., etc. Pp. 112, 8vo.; with numerous engravings. Philadelphia. 1857. From the Academy.

Act of Incorporation, and List of Members of the Acad. Nat. Sci. of Phila. Pp. 38. *Donations, etc.*, to the same. Pp. 36. *Proceedings* of the same. Pp. 100. From the Academy.
Quinine in Fever: By Isaac Casselberry, Evansville, Ind. Pp. 13.

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PROGRESS OF MEDICINE.

THE NEW ORLEANS

MEDICAL AND SURGICAL JOURNAL

FOR SEPTEMBER, 1857.

ORIGINAL COMMUNICATIONS.

Art I.—*Practical Remarks on the Evidences of Pregnancy:* By Dr. J. E. Thompson, Roseville, Arkansas.

No subject in the broad field of medical science, has stronger claims upon the medical adviser for their careful observance, than the evidences of pregnancy; as well from its vast importance as from the difficulty so frequently attending its investigation.

No greater responsibility can be placed upon him, than to be called on to evince the existence or non-existence of pregnancy; that peace of mind, domestic happiness, character, property, nay, even life itself, may be sacrificed by inaccuracy in his diagnosis. The medical man is frequently called upon by his patient, who is anxious merely to become acquainted with her real situation, when a failure or refusal to give a decided and correct answer, engenders in her mind dissatisfaction and want of confidence. How much is his embarrassment increased, when called upon to decide those cases where private character or public justice is at stake, and in which, from their very nature, must be expected nought but concealment and misrepresentation. Every practitioner knows, that difficulties in this respect do, and by no means very unfrequently, meet us in our practice. Hence, the importance of thoroughly investigating and perfectly understanding the phenomena of pregnancy.

Pregnancy is the state of a female, who, after conception, contains within her the fecund of a new being; beginning simultaneously with conception and terminating in parturition, which generally takes place in forty weeks, or 280 days.

Pregnancy may be estimated as existing under four general heads: 1st. Simple pregnancy; 2d. Compound pregnancy; 3d. Complicated pregnancy; and 4th. Pseudo-pregnancy.

Each one of these forms, to a greater or lesser degree, presents different symptoms or evidences of its existence. The evidences of pregnancy considered generally are, 1, presumptive evidences; 2, sensible evidences.

I. PRESUMPTIVE EVIDENCES:

The presumptive signs are those which induce us to suspect or presume that the female is pregnant: amounting merely to the patient's history of her own case. Although these evidences are quite numerous, they are very uncertain, and of minor importance to the accoucheur in forming his diagnosis. The presumptive evidences may be divided into general and local: General, from all the changes experienced by the female in the regular and natural progress of her functions, in her habits, her peculiar inclinations and tastes, the effects of which are marked particularly by the paleness of the countenance, and certain alteration in the figure, which belongs only to pregnant females, but which the most experienced eye cannot always detect. The local signs are, suppression of the menses, enlargement and development of the abdomen, discoloration of the areölæ, swelling of the mammæ, etc., etc.

The human frame is composed of a variety of organs supplied with nerves enabling it to perform a double function: first, one by which it maintains its connection with the external world, receives impressions, and performs certain voluntary and involuntary motions and actions; and, secondly, one which unites the parts of the animal frame, constituting it a whole. This last quality, with which every part of the animal organism is more or less endowed, is called *sympathy*. The nearer animals approach to the most perfect state of existence, the more acute will be their sympathies. On the other hand, in cold blooded animals, where each separate organism possesses a greater degree of individual vitality, there is much less sympathy between the different organs and functions of the body; and of course, we find a less perfect general organization. Blumenbach explains this phenomenon by "the proportion the brain bears in size to that of the nerves proceeding from it," which in the inferior animals is much smaller than in the higher classes

Sympathy has a general and a particular operation; general, when the whole organism sympathises with one organ; particular, when only one part of the whole organism sympathises with another. This sympathetic connection is much more observable in some organs than in others; and it is in many purely latent, until developed by a variety of causes, such as newly acquired or periodic functions, and altered or diseased actions. Sympathy between organs may be mediate or immediate; mediate, when this peculiar connection exists directly between two organs; immediate, when it exists through the intervention of a third. The uterus furnishes us with examples of these different kinds of sympathy, which become developed in a most striking manner in pregnancy, and those diseases most likely to be compounded with it; they may, therefore, with justice be termed the *sympathetic signs of pregnancy.*

The sympathy existing between almost all organs is reciprocal; that this is the case with the uterus will be apparent, when we recollect how frequently it sympathises with other organs, as well as they with it. Of this fact we have abundant proof in the frequency of the occurrence of abortion from vesical, alimentary, or even mental excitement, which indicates the necessity of attending to this phenomenon as a matter of paramount importance in the treatment of such cases.

The first symptom or sign indicating pregnancy, is observable immediately on the occurrence of conception. A peculiar sensation is experienced similar to a rigor or spasm, followed by a feeling of indescribable pleasure, which, however, is not of long continuance, and is succeeded by a sense of languor and depression. However, sensitive females frequently experience similar sensations after each coitus, and yet have not become pregnant. Conception is frequently accompanied by a general excitement of the system, with increased vascular action, such as quick pulse, heat of the surface, fever, perhaps of a hectic form with periodic exacerbations, attended by exhaustion, debility and emaciation. This state, however, seldom occurs, only in females of a peculiarly nervous temperament. These symptoms, however, may be produced by derangement of the catamenial discharge, and cannot be looked upon as positive. Pains in the pelvic and lumbar regions may occur immediately on the occurrence of pregnancy, or a few days after, when they depend upon sympathy. These pains may also be present in retained or difficult menstruation, as well as in pelvic and abdominal tumors. The sympathetic connection existing between the stomach and uterus, causing diminished or depraved appetite, cardialgia, dyspepsia, nausea and vomiting, commonly denominated *morning sickness*, though a very usual concomitant, is very far from being a certain sign of pregnancy. It is frequently entirely wanting until the quickening period, and sometimes never occurs till near the close of gestation. It also occurs in delayed menstruation, and in many other diseases. "It may, however, be considered as adding to the general testimony in proof of this condition." (Dewees on Females, p. 163, 8th edition.)

Absence of the menstrual discharge is also regarded as an important datum in diagnosticating pregnancy. Some consider this as conclusive evidence, relying wholly upon it; while others look upon it as quite inconclusive. Dr. Denman says, (System of Midwifery, vol. 1, p. 270,) "I have not met with a single instance of any female continuing to menstruate when she was pregnant." This is rather remarkable. How so scientific and practical an accoucheur as was Dr. Denman, should, in the course of many years of extensive practice, *never have met with a single instance* of the catamenial discharge appearing during pregnancy, is surprising. Every intelligent practitioner knows that the occurrence of the menstrual discharge is of so common an occurrence, that its absence cannot be regarded as conclusive evidence of uterine pregnancy. However, in connection with other evidences, it may be regarded as good evidence. Dr. Dewees says: "Few signs of pregnancy are more equivocal than the suppression of the menses, and should never be relied on, farther than that sign is entitled to."—(Diseases of Females, 8th edit., p. 158.) Again, on page 161, the same author remarks, "I well know a number of women who habitually menstruate during pregnancy, until a certain period; but when that time arrives, menstruation ceases; several have menstruated until the second or third month, others longer, and two until the seventh month; the last two were mother and daughter. I am certain there was no mistake in the cases to which I now refer. First, the menses were regular in their returns; not suffering the slightest derangement from the impregnated condition of the uterus; secondly, from two to five days were employed for their completion; thirdly, the evacuation differed in no respect from the discharges in ordinary, except they thought it less abundant; fourthly, there were no coagula in any one of these discharges; consequently, it could not be the common blood, or the blood of hæmorrhagy; fifthly, in the two protracted cases, the quantity discharged regularly diminshed after the fourth month, a circumstance, not perhaps difficult to explain." Heberden in his Commentaries (chap. 43,) reports a case of this character. Dr. Blundell says, "I have repeatedly met cases of pregnancy in which the catamenia have continued to flow during the first two or three months."—(London Lancet for July 18th, 1828.) Dr. Ramsbotham (System of Obstet. by Keating, p. 83,) remarks: "The suppression of the catamenia has been dwelt upon from time immemorial as a most valuable sign: considered by itself alone, it would prove a most fallacious one, for there is no practitioner of any experience but could adduce many instances of this discharge continuing on for several months in a pregnant female." Dr. Maygrier, of Paris, in his Midwifery Illustrated, (Third edit. by Doane, p. 78–9,) remarks: "The suppression of the menses, however, is so far from being a certain sign of pregnancy, that it is not always a rational sign. Besides, its constant and regular appearance does not prove that the female is not pregnant, since numerous examples show that females, although pregnant, have menstruated, at least during the early months of gestation." Deventer mentions a case in which the female never menstruated unless during the period of utero-gestation. (Midwifery, cap. 15.) Dr. Kennedy has observed similar cases. (Obstet. Auscultation, p. 12.) Dr. J. E. Taylor in his edition of Kennedy's Obstetrics, (p. 12,) remarks: "Two cases have occurred under my notice, where the females had had six children and never had their periods, except as a sign of their being pregnant during nursing. Three cases were especially noticed, where pregnancy existed while this discharge continued—two were at the fourth month, and the third in the third month. Two of these cases ceased at the fifth month, and were afterwards attended by myself, the other case I did not attend, but repeatedly saw her prior to her accouchement."

Dr. Blundell remarks in his Lecture on Menstruation, (Lancet for July 18th, 1828,) "That we must not conclude that a woman is not pregnant merely because she menstruates: for although doubts may be raised respecting the continuance of the catamenia during the whole term of gestation, yet I have repeatedly met with cases of pregnancy, in which the catamenia continued to flow during the first two or three months; indeed this, notwithstanding Dr. Denman's assertion to the contrary, may, I think, be looked upon as by no means very uncommon." If there be any occasions where physicians ought to be more prudent, and to make more reflections upon their prognostics of important cases, it is on those occasions which concern their judgment as to conceptions and females being pregnant, to avoid the great accidents and misfortunes which they cause, who are too precipitate in this respect, and without a certain knowledge. The faults committed through too much fear at such times, are in some measure excusable and pardonable; but not those caused by temerity and consummate ignorance, which are incomparably greater, and altogether unpardonable. There are multitudes of defenseless females who have been caused to miscarry by medicines, under the pretense that they were not pregnant, which are only so many murders perpetrated by heartless knaves under the garb of science. Many instances are upon record, the results of ignorance and rashness; one of which is recorded by Mauriceau, (Book 1, p. 17:) "In 1666, in Paris, a miserable example of this kind in a woman hanged, and afterwards publicly dissected near the Kitchen Court of the Louvre, who was four months gone with child, notwithstanding the report of the persons who visited her, by the judge's order, before her execution, who affirmed that she was not pregnant. They were deceived because the woman had her '*monthly courses.*' Whereupon," adds Mauricean, "it is not fit to be too confident, forasmuch as there are many with child who *have their courses;* and I have known some who have had them all the time of their great belly till the fifth or sixth month, which happens according to the woman's being more or less sanguine, though the greatest number usually have them not; but there are few general rules which may not be sometimes excepted against." A case is related by Bandelocque, of a French countess, imprisoned during the French revolution, who was accused of carrying on a treasonable correspondence with her husband, an emigrant; she was ordered to be examined by two of the best midwives in Paris, and they declared her not pregnant. She was accordingly guillotined, and her body taken to the School of Anatomy, where it was opened by Baudelocque, who found twins in the fifth month of pregnancy."—(Rigby's Syst. of Midwifery, p. 98, Am. Edit.)

It very frequently occurs that the catamenia is arrested for a considerable time, when there are no other evidences of bad health. I have known two females, the one having borne seven children, and never menstruated since the period of her marriage; and the other nine, and during the period of having the last four, did not menstruate. They enjoyed remarkably good health during the whole time, except the usual phenomena of pregnancy. Dr. Denman says, (Syst. Mid. p. 272,) "I have known many instances of married women who had ceased to menstruate for several months, independently of any disease when they were not pregnant." Rondelet speaks of a female who had borne twelve children, and Joubert of another who had eighteen, and never menstruated. Dr. Ramsbotham says: "It is common in newly married females, upon the excitement in the genitive organs consequent upon their new condition, or the congestion occurring in the uterus as a result of too frequent copulation, to have a temporary catamenial suppression."—(Syst. Obstet. by Keating, p. 83.) It is not by any means uncommon for a female to become pregnant whilst nursing, when no menstrual discharge has been observed after her former confinement; when of course this evidence is of no avail. Dr. Conquest remarks in his evidence in the House of Lords on the Gardiner Peerage case: "I think the evidence connected with menstruation so uncertain, that, as I have before stated, I found my calculations more in the circumstances of quickening. Women are constantly falling pregnant whilst performing the duties of nursing, when they do not menstruate, and should not menstruate."

From the foregoing, we infer that suppression of the menstrual discharge is not at all times attendant upon pregnancy. When it is not associated with other signs unmistakable in their character, as an evidence, it is worth but little to the accoucheur in performing his diagnosis. Suppression of the catamenial discharge may also be caused from a mechanical obstruction, as imperforate hymen, or adhesion of the walls of the vagina, when they are otherwise naturally secreted; from ovarian or general dropsy, hydatids of the uterus as well as enlargement of the same organ, chlorosis, and chronic diseases attended with debility, as phthisis.

The occurrence of sympathetic pains and uneasiness in the mammæ about the third month, sometimes, however, at an earlier or later period, is also regarded as a symptom of pregnancy. There is however, but little dependence to be placed upon this circumstance, as the connection between the uterine organs and the mammæ is so strong, that they sympathise in almost all the morbid affections and altered states to which the former are liable. We have a remarkable instance of this in cancer of the uterus; also in amenorrhœa and dysmenorrhœa. There are sometimes sympathies in which the heart and lungs, and frequently the liver are engaged; these, however, are of rare occurrence. Those which exist between the uterus and the brain, either with or without the intervention of the stomach, are very frequently met with: such as vertigo, headache, drowsiness and convulsions. There is also a state of great anxiety and apprehension in the pregnant female for her safety, and much solicitude for the result of her pregnancy. Extreme mental irritability also occurs, rendering her who was amiable and good-tempered a torment to herself, and actually shunned and avoided by her friends. Antipathies, vitiated appetites, and desires or longings are also developed, produced by the brain's sypathising with a vitiated state of the stomach, depending upon irritation of the uterus. These appetites are sometimes of so unnatural a character, as to border on insanity. A case is recorded where a lady's longings became so preposterous, as to prompt her to breakfast upon a certain baker's shoulder in the neighborhood, or her child would be deformed, i. e., born with but one shoulder. These symptoms, although observed in pregnancy, are frequently noticed in other diseases, particularly in chlorosis, where they arise from the same cause, i. e., irritation of the uterus. They are of no importance in a diagnostic point of view. Numbness and cramps of the lower extremities are also enumerated as symptoms of pregnancy. Constipation of the bowels is very common in this state, the reverse state also sometimes occurs. But these symptoms occur from so many different causes, remote from pregnancy, that they are of but little consequence. Ptyalism sometimes occurs, though in a moderate degree. "But," according to Dr. Dewees, "when it does happen, it very decidedly points out this condition; I do not remember to have observed this symptom from any other state in the uterus."—(Dewees on Females, p. 169.) Though, ptyalism may occur when it is not produced by pregnancy or any other known cause. Dr. Dewees speaks of two females who became salivated, who were not pregnant, whose salivation could not be traced to any particular cause, unless from some particular condition of the stomach, as much nausea attended. Dr. Dewees speaks of a *frothy saliva* which is frequently spit up by pregnant females. He remarks: "This saliva is very tenacious, and very difficult to deliver from the mouth; it is extremely white and a little frothy, and when discharged upon the floor, assumes a round shape, and about the size of a shilling piece—hence the expression, that the person is 'spitting English shillings, or cotton;' and so far as I have remarked, it is almost a certain sign of pregnancy."—(Dewees on Females, p. 169.) The state of the bladder is looked upon as furnishing important facts in diagnosticating pregnancy. Stranguary, incontinence, and suppression of urine, have been alternately looked upon as symptoms of the existence of pregnancy. Stranguary may occur in the early months from sympathy between the uterus and bladder; but it is more frequently noticed in advanced pregnancies, when it is caused by mechanical pressure of the enlarged uterus. Incontinence of urine occurs in the latter months of gestation, and is more troublesome during involuntary actions of the abdominal muscles, as in coughing or sneezing, especially when the patient is in an erect position. Dr. Taylor remarks, "I have repeatedly seen this as a symptom during the second and third months, accompanied with pain in passing water, and a discharge from the vagina; many females have from this sign decided that they were pregnant." Of all the signs deduced from the state of the bladder, and the most dangerous to the female when it occurs, which fortunately, however, is seldom, is that of suppression of the urine, as it is, if not produced, frequently kept up by retroversion of the uterus. This, however, seldom occurs until about the third or fourth month of pregnancy, and when combined with other symptoms of retroversion, may be looked upon as strong evidence of pregnancy at that period.

At the end of the fourth month, or at the beginning of the fifth after impregnation, the female is made sensible, for the first time, of a peculiar fluttering movement low in the abdomen, attended by a feeling of agitation, syncope or an hysteric paroxyism, which is termed *quicken-*

ing. Some writers, among whom are Dr. Morley, contend that quickening is caused by the uterus suddenly rising out of the pelvis; while others, among whom are Drs. Denman, Maygrier, Dewees, Ramsbotham and others, regard it as being the first muscular action of the fœtus perceptible to the mother. At the fourth month, the uterus rises above the lower pelvis, with its base two or three fingers' breadth above the region of the pubis: this probably gives rise to the movements of the fœtus, being stronger at this particular time, and first observable by the mother. At this period, those distressing symptoms which have been attendant frequently, from the moment of impregnation, now partially subside, and the female is seldom troubled any more during the remaining period of gestation. This motion depends in a greater or lesser degree upon the strength of the fœtus, the quantity of liquor amnii, and the sensibility of the uterus itself. The period of quickening may perhaps occur earlier in females of a particular nervous sensibility. In first pregnancies, this movement is frequently attended with considerable alarm, especially in irritable females, on the part of the patient: small quantities of blood are frequently discharged in connection with the occurrence of quickening, and are looked upon by many as a corroboration of the existence of pregnancy. This period is frequently looked forward to with a great deal of anxiety by those who are either doubtful as to their being pregnant, or being really so, suffer much from the early symptoms attending gestation.

As the symptoms we have already enumerated may, many of them, be absent, or if present, in such a contradictory manner, as to give rise to doubts and perplexity in the minds of both patient and accoucheur. In this embarrassing state of affairs, we must wait till the period of quickening, as the only means to set things right. Unfortunately, however, we are again thrown into doubts and increased perplexity. For every day's experience goes to show that this symptom is not a less fallible criterion than many of those already mentioned; as again and again we meet with cases where females, who are not pregnant, assert, with such a semblance of veracity as could only arise from conviction, that they have experienced this sensation, and that it was attended with the usual sypmptoms of weakness and fainting. It is quite extraordinary, how females, who have borne several children, will insist on their having felt these motions, and the impossibility of their being mistaken, after having felt these sensations so frequently before. In some females, the motion of quickening is so obscure, as not to occasion any distress; and where the ascent of the uterus is very gradual, it is often not felt at all. Dr. Denman remarks: (System of Midwifery, p.

130, 6th edit.) "The motion of the child is so obscure in some women, or such little attention is paid to it, that it is not perceived or regarded, and in others so indistinct, as to be confounded with various other sensations. In cases, therefore, of supposed or mistaken pregnancy, women often fancy that they feel the motion of the child; or if the child has died in utero, when there is, after birth, the fullest proof that it must have ceased to live for a long time." "I am aware," says Dr. Conquest in his evidence on Report of Proceedings of the House of Lords on the claims of the Barony of Gardiner, (p. 106,) "the circumstance of quickening is not always to be relied on; many old women who are *determined* to have children when they marry late in life, and many single women who wish *not to have children*, are very apt to be deceived.

Dr. Blundell says: "I know an instance of a lady, possessing more than average intelligence, the mother of twelve children, who was led by certain abdominal movements into an erroneous persuasion that she was again pregnant; for spasms of the abdominal muscles, and flutterings of the bowels, may now and then be mistaken for the movements of the child." Some females possess the very extraordinary power of simulating the fœtal movements by the action of the abdominal muscles so exactly, that the most experienced and intelligent accoucheur might be deceived, and led to pronounce opinions that might entail upon him volumes of calumny and regret.

A case is recorded by Blundell, of a female who possessed considerable skill of this kind, and exhibited her talents in London for hire; she was visited by Lowden, Mackenzie, and other celebrated accoucheurs of the day, and, upon becoming satisfied that the uterus was not enlarged, they examined the abdomen, and were all agreed that the movements were so exactly analogous to those of a fœtus, that no distinction could be clearly made, and had there been no internal examination made, judging from this abdominal action alone, they should have been well satisfied, that the woman was in the fourth or fifth month of utero-gestation.

In 1854, a female sixty years of age came to me, declaring she was pregnant, and six months gone. She asserted that she had quickened about four weeks previous, and could now distinctly feel the movements of the child. Upon placing my hand upon the abdomen, and after considerable pressure, I could feel motions exactly similar to that of a fœtus. She was much emaciated, and had been troubled with dyspepsia for years. Upon examining the uterus *per vaginam*, I discovered a polypus about the size of a goose-egg attached to the uterus: the motions proved to be the aörtic pulsations. She could not be convinced that she was not pregnant, till I extracted the polypus. Dr. Kennedy refers to a similar case: (Obstet. Auscul., p. 27, by Taylor,) "I saw a very remarkable case of this kind in company with Dr. Lee and Mr. Herron. The subject was much emaciated, having labored for some time under obstinate hysteria, attended with aggravated dyspeptic symptoms, which she ascribed to bleeding. On examination, she drew my attention to what she termed the quickening movements of the child; this was the aörtic pulsation, which could be distinguished by the hand through the integuments; nothing could convince her that she was not pregnant. I have known women to insist upon their having felt the child moving and kicking within them, not only in cases where there was indubitable proof of the child's death at the time, but also, as mentioned in the case of quickening, where no child was in the uterus." What is the cause then, of this fallacy? We believe it arises, first, from the sudden escape of a portion of air from one part of the intestines to the other; second, from the pulsation of the aörta through the abdominal integuments; third, from spasms of the uterus, as in nervous or hysterical pseudo-pregnancy; fourth, from hydatids, polypuses and excrescences of the uterus; fifth, from abdominal dropsy, dropsy of the uterus or ovaria; sixth, from exalted peristaltic action; seventh, from irregular or simulated contractions of the abdominal muscles; eighth, from mere imagination of the female; ninth, from an enfeebled state of the fœtus, where it is small and hydrocephalic and a quantity of liquor amnii exists; or, a large fœtus, and little liquor amnii. Either of these two last states may entirely obscure the motion of the fœtus from the notice of the mother at this particular period. Baudelocque and Leveret give instances where females have carried children to the full time without quickening or being sensible of the motion of the fœtus.

Dr. Taylor speaks of a female who did not perceive the movements of the child, till it was felt kicking against her after it was born. Dr. Kennedy speaks of two women who had every other symptom of pregnancy, and yet one of whom carried two children, and the other, one, to the full period, without quickening or feeling the motion of the child. Add to this the possibility of a female quickening during sleep, and of course the circumstance passing unnoticed.

Thus, we perceive, that quickening may either not occur when a woman is pregnant, or, as is frequently the case, a sensation so exactly resembling it, as to be mistaken for it even by women who have borne many children, may be and is very frequently experienced. Hence, a great deal of deception may ensue from too implicit confidence in this sign. Dr. Ramsbotham remarks: "The action of the fœtus in utero, is a positive sign of pregnancy; but its absence does not prove the non-pregnant condition, since no movement could be detected if the fœtus were dead; and its detection might be extremely difficult when the fœtus was feeble."—(System of Obstet., p. 85, by Keating.)

We are now through with the presumptive evidences of pregnancy.

II. SENSIBLE EVIDENCES.

This division will embrace a class of signs, which, from their being cognizable to the scrutiny of the accoucheur, and not depending upon hearsay testimony, must approach nearer to what we may term demonstrative evidences. This will be the more apparent when we come to examine them in detail, when we shall find them not depending, as was generally observed in the former case, upon sympathies more or less remote, but most frequently being essentially and physically caused or produced by that which we wish to detect, namely, *the fœtus in utero.* To facilitate the investigation of these evidences, which are cognizable by the medical attendant, they may be divided into three classes: first, Tangible evidences, or those which come within the range of a manual examination; second, Visible evidences, or those which are exposed immediately to our view; and, third, Audible evidences, or those detected by auscultation.

First. Under the head of evidences of utero-gestation sensible to the touch, we shall consider the alterations in size, form, and position of the uterus and the other organs of generation, as ascertained by manipulation; also the motions of the fœtus in utero, whether active or passive, which are communicated to the hand of the examiner.

Considerable weight has been attached to those signs elicited from *le toucher* or examination *per vaginam;* the object of which is, first, to ascertain the condition or state of the uterus, and second, that of the vagina. Our first step is to place our patient upon her left side on the bed, with her hips close to the edge of it, and having oiled the index finger of the right hand, we introduce it within the vagina, pressing against its sides. If the person be a virgin, we shall find considerable difficulty, as the canal is contracted, and any attempt to force the finger into it produces considerable pain. If the *hymen* is perfect, we cannot accomplish this without destroying this membrane; in some it is more perfect and complete than in others; indeed, it occasionally entirely closes the vaginal passage. Formerly, the absence of this membrane was looked upon as a proof of the want of virginity; but this view has gone into disrepute, as there are cases in which it is scarcely perceptible at a very early age, when it could not have been destroyed; and even where it has been perfect, it may have been destroyed in various other ways without sexual connection causing its rupture. Its absence, therefore, proves nothing; as it cannot inform us with any certainty, whether the individual may have had sexual intercourse or not. Neither is a perfect hymen a proof of the absence of pregnancy. There are cases on record of females having the hymen, or a portion of it, at the time of their labor. Dr. Tucker met with a case in which this membrane was perfect in a woman taken in labor. (Merriman's Synopsis, p. 218.) The same circumstance was observed by G. Tortosa, Champion, and Mauriceau. When impregnation takes place under these circumstances, it is generally the result of one coitus; hence, this accounts for the fact of its being oftener met with in seduced females. Dr. Kennedy records a very remarkable case of this kind in his work on Obstetric Auscultation: (p. 33–4, by Taylor,) "In March, 1830, a very respectable man, servant in Mr. B.'s family, waited upon me in company with his niece, an interesting and innocent looking girl of about twenty years of age. He stated that his mistress was anxious to take her as her waiting-maid, but as an apothecary, who had lately prescribed for the girl while in a bad state of health, pronounced her pregnant, he brought her to me to ascertain, or rather to disprove it, for of her innocence he seemed perfectly satisfied. On questioning the girl, at first, in her apparent innocence, she seemed quite amused with the imputation, asking me, with the greatest *naïveté*, whether *she could have become so in her sleep*? On persisting in my inquiries, however, she denied in a most solemn manner, the most remote possibility of such being the case, and that with such seeming absence of guile, as caused me to doubt whether her character had not been unjustly called in question. This idea was heightened when I could discover no abdominal enlargement or sensible change in her breasts, and on her denying her having had any sickness of stomach; she admitted that her menses had not appeared for three months. What struck me, however, as very curious, was, that on my proposing a vaginal examination, in place of its being objected to, as it almost always is, and that with extreme obstinacy, by delicate-minded females, and particularly by such as are unmarried, she acceded to it with alacrity, and appeared almost to seek it; the reason of this soon became obvious enough, as on my endeavoring to insinuate the finger within the vagina, it was completely stopped by the most perfect hymen that ever came under my observation, and every attempt to proceed with the examination, and get the finger up to the uterus, was attended with such distress and irritation, as to oblige me to desist. Auscultation was now had recourse to, and the fœtal heart's action and placental souffle were detected. On my informing her that I had quite satisfied myself of her being pregnant, she still persisted in her denial, and laid great stress on the circumstance of her parts being perfect and uninjured. I now perceived the drift of her conduct in submitting so willingly to the examination, and that the girl herself, from this circumstance, was confident that she could not be pregnant. However, she was soon undeceived in this respect, and at length confessed that a married man had once had connection with her, but that he had taken precautions to avoid injuring her, and assured her, whilst she remained perfect in this respect, she could not become pregnant, a fact which she implicitly believed. In this they were both deceived, as she was delivered in the Lying-in-Hospital, on the 24th of August, 1831, of a full-grown female infant."

There is a peculiar bluish or purplish tinge of the vagina, upon which M. Jacquemier has called the attention of the profession, during the early months of utero-gestation. He states that between 4,500 and 5,000 females have been examined by him in the La Force prison, and in no instance has he been mistaken. This is corroborated by Parent-Duchâtelet. In some cases of chronic inflammation of the uterus, and congestion of the neck, both the neck and vagina present this bluish appearance. I have specially noticed it in syphilitic patients, which class, M. Jacquemier has principally examined; for he himself affirms that the vaginal membrane may acquire a darker color than usual, from other causes than pregnancy. I have noticed it during the latter months of gestation, but there appears sufficient reason why this should take place at this time, for the uterus is enlarged, and pressing upon the principal venous vessels which supply the vagina, creating a stasis of blood. It has been particularly noticed by Mr. Cruickshank during the rutting season in the lower animals.

In the virgin, the neck of the uterus is fleshy, firm, hard, and of a projecting papillary form, measuring about two-thirds of an inch in length. In the female who has borne children, this part of the uterus, although it never regains its primitive form and structure, approaches so nearly to it in many cases, that it would be next to impossible to determine whether the individual had ever borne children or not. At the same time, cases are often met with, in which the neck of the uterus remains after childbirth, broad, short and flabby, with the *os* gaping. After impregnation, the orifice of the uterus, which before gaped, is now sealed up by a peculiar glue, or adhesive substance, while the neck and os become considerably softer. According to Leveret, its two lips now form an equal plane, whereas, hertofore, the anterior lip was prolonged downwards below the posterior. Stein states that the orifice, which had been of a triangular form, now becomes circular. The following is a general view of the physical phenomena presented in the uterus, during the course of gestation through each month.

First Month.—At this period there is but little change observed in the form and volume of the uterus. However, some writers, as Kennedy, Taylor, etc., assert that the uterus enlarges considerably during the first month; while others assert that it does not sensibly enlarge, among whom is Dr. Maygrier, who remarks: "At the end of the first month, the accoucheur has no sensible evidence of the existence of pregnancy, nor even of *fulness* or *action* in the uterus."—(Midwifery Illustrated, p. 80.) It is probable that both of these assertions are upon extremes; and we would hit the mark better to admit that there *is an action of the uterus* in a greater or lesser degree, but no sensible fulness; this action amounting to a contraction of the uterus, as if it would embrace more intimately the new product enclosed within it.

Second Month.—Towards the close of the second month the uterus enlarges very much; its form is round and fills most of the lower pelvis; but the abdomen, on the contrary, becomes contracted, tense, and sometimes a little painful. The fundus is inclined to the posterior part of the pelvis, consequently throwing the os nearly against the pubis, hence, changing the relation of its axis, bringing the os nearly within reach of the finger, as the anterior portion of the vagina is shorter than the posterior, the finger has a shorter distance to travel to reach it.

Third Month.—It now increases in length as well as in size, its base rising as high as the pelvic region, being on a level with the abdominal strait. Its form is rounded, globular and unequal, and may be raised without pain to the female. The abdomen now, for the first time, becomes slightly tumefied by the crowding back of the intestines. There is but little change in the neck as yet.

Fourth Month.—The uterus now rises above the lower pelvis, with its base two or three fingers' breadth above the region of the pubis. The relation of the uterus to the axis of the pelvis is changed, and the os, which was before perceptible low down, will be felt high up and nearer to the sacrum. The abdomen now becomes quite enlarged.

Fifth Month.—The existence of a fœtus in utero may now be ascertained with considerable certainty, both the sensible and rational signs uniting to form it. The base of the uterus is now as much as one inch and a half below the umbilicus, and is of a spheroidal shape; the neck is higher, inclined to the left and behind, and the vaginal portion of the neck slightly diminished. The os is still closed, but is softer. The presence of the fœtus may now be demonstrated by *le toucher* with certainty. It is at the beginning of this month that quickening is observed. Ballottemeut is performed with a great deal of certainty during this month, and clearly detects the fœtus in utero.

Sixth Month.—The uterus now developes so rapidly, that its base is found two fingers' breadth above the umbilicus; its form is that of an ellipse, and is elongated from above downwards. The neck now begins to enlarge at the base, swells and becomes softer; the os now is slightly opened, and will nearly admit the end of the finger; indicating that it is now fully prepared to take a part in the general dilatation of the uterus. The abdomen now becomes much enlarged, and the child's head can be distinctly felt through its distended parietes.

Seventh Month.—The fundus of the uterus now begins to enter the epigastric region. But the degree of its elevation is less than in the former months, and it still decreases. The uterus, instead of being elliptical, now begins more and more to assume the spherical form, depending on the dilatation of the neck, and the active part it takes in the enlarging of the uterus. The neck becomes shorter and softer, and the os opens so as to admit the end of the finger with ease. The female now becomes much larger by the increase of the lower planes of the uterus. The child's head is now so large, that it can no longer be displaced by the touch, without considerable force and pain to the patient. This circumstance renders pregnancy doubly evident, and serves to accurately determine its advanced stage.

Eighth Month.—During the whole of this month, and especially towards the end of it, the base of the uterus occupies most of the epigastric region. It becomes much more capacious, and more and more spherical and rounded; the umbilicus is much distended, and the neck becomes shorter, softer and more enlarged, especially towards its anterior lip. The neck can now be reached only with much difficulty, owing to its antiversion. The child's head is now large and heavy, and can be raised only with difficulty.

Ninth Month.—The end of this month is the end of pregnancy. Now the base of the uterus, instead of rising as usual, sinks and is found near the umbilical region. The amplitude of the organ affects the sides, in consequence of the dilatation of the neck and its extreme enlargement; the latter of which has entirely become defaced, and now assumes the form of a soft cushion, more or less enlarged. The child's head being large and heavy, is now engaged in the superior strait.

Although the foregoing are the changes that usually take place in the body and neck of the uterus, yet these changes are not implicitly obeyed in all cases; in some cases, according to Smellie, "the neck is formed as long in the eighth month as it is in others in the sixth."—(Midwifery, vol. 1, p. 183.) On the other hand, according to Dr. Gooch, "it is as much altered at the fourth month, in some women, as in others in the sixth; especially in those who have had several children, in whom the neck yields more readily than in first pregnancies."—(Midwifery, p. 214.) The uterus, however, may be *enlarged*, and yet the female not be pregnant; and it is important that the acconcheur should be able to distinguish between an enlarged uterus caused from impregnation, and that produced from other causes. In the unimpregnated uterus, when the finger is passed up between the os uteri and the pubis, it meets with no solid resistance; the bladder and soft parts here yield to pressure, and if the pelvis be shallow and the patient thin, the fingers of the left hand pressed firmly down into the pelvis from above, behind the pubis, may even be distinguished by the finger of the right hand introduced into the vagina. But we do not find this the case in the impregnated female; as the body of the uterus, becoming enlarged, fills up this space, and the finger in the vagina meets with the firm resisting tumor or enlarged body of the uterus. By placing the left hand on the tumor, and pushing it down within our reach, communicate the sensation of its being the motion of the same body above and below, and what effect moving the tumor and neck below shall produce on that felt above. Dr. Gooch remarks, "by this means the practitioner becomes certain that the tumor which is felt through the walls of the abdomen, is the same as that which is felt through the vagina, the most satisfactory proof that it is an enlarged uterus."—(Diseases of Females, p. 215.) It is evident, that in diseased enlargements of the body, or appendages of the uterus or of the neighboring viscera, as diseased ovary or distension of the fallopian tubes, the alternate motion of the uterus and tumor above and within the pelvis, will often produce the corresponding motions alluded to. We conceive that Dr. Gooch's manipulation could not convince us of the presence of a fœtus in utero, unless the motions of the fœtus were felt through the distended abdominal parietes, as this enlargement may be produced, first, from a dropsical state of the uterus; second, from diseases within its cavity, as tumors or excrescences; third, from moles, or false conception, or hydatids; fourth, from a retention of the menstruous blood from the occlusion of the os tincæ. But when this enlargement, as distinguished through the parietes, be uniformly round, smooth and elastic, combined with rational and sensible evidences, the proof of pregnancy is very strong.

Abdominal enlargement, if not the most certain, is at least the most familiar evidence of pregnancy, and invariably accompanies this state, when at a sufficiently advanced stage. Until after the third or fourth month, and often later, the uterus does not rise out of the pelvis, and, of course produces no abdominal enlargement. From thence to the sixth month, it enlarges progressively, and may be felt between the pubis and umbilicus, and previous to this time the abdomen is tense and rounded. The fundus of the uterus generally arrives at the umbilicus about the end of the sixth month; in the seventh it gets above this point; in the eighth, gets into the epigastric region; in the ninth month, it approaches to the scrobiculus cordis, and falls somewhat lower down a little before labor. The spinal column prevents the uterus from keeping an exactly central position; it will therefore be found to exhibit a greater bulk at one side or the other, according as the child is placed more to the right or left side. However, the progressive enlargement of the abdomen is subject to a great many variations; for instance, the pelvis being much under or above the standard size, will cause the uterus to rise earlier or later into the abdomen. Again, the abdominal parietes being very tense and unyielding, may render the ascent of the uterus into the abdomen apparently more early; while, on the contrary, where there is an extreme degree of relaxation in these parts, the uterus does not rise so early, but may lie low in the abdomen, the tumor in some cases projecting directly forward, or even hanging down over the pubis. Dr. Kennedy relates an interesting case of this kind in a "woman who had had a number of children; when in labor with her second child, hernia took place at the umbilicus, which gradually increased in extent with each child she carried, until at length the impregnated uterus made its way completely out of the abdomen, and became suspended over the pubis."—(Obstet. Auscul., p. 47.) There are cases in which the occurrence of a progressive enlargement or development in the abdomen, exactly corresponding in progress and degree with that observed in pregnancy. A defined tumor or fulness is observed first in the pelvis, and then rising gradually out of this and proceeding upwards, as does the impregnated uterus, as ovarian dropsy for instance. The progress of the suspected tumor requires to be watched with care. If they are developed slower or quicker, with irregularity, sometimes rapidly for a time, and then become slower or altogether suspended, we may suspect that the tumor is not caused from pregnancy. Or, if the tumor does not present that peculiar circumscribed or globular form, or as pregnancy advances, approaches to an ovate, narrowing from above downwards, presenting projecting inequalities, and a yielding sensation to the touch, caused by the limbs and other prominences of the fœtus, and distension with the liquor amnii, we may suspect that it is not caused by pregnancy, and give our diagnosis according. Enlargement of the abdomen may be produced by many causes foreign from that of pregnancy: 1st, Dropsical affections of either the abdomen, uterus or ovaria; 2d, Chronic disease of the uterus itself or of the ovaria; 3d, A retention of the catamenia, from some cause preventing their flow; 4th, Enlargement of almost any of the abdominal viscera. Consequently, but little reliance can be placed upon this circumstance, though combined with others of greater importance. Dr. Blundell records an interesting case, which should be kept in remembrance by all accoucheurs as a beacon to shun a similar error: "Dr. Haighton was sent for in consultation with a distinguished London surgeon, to a case supposed to be ascites, for which the patient was to be tapped the next day. Dr. Haighton suggested that this swelling might be a dropsy of the uterus, but no particular examination was made to ascertain this. During the night, the sack containing this fluid gave way, and a flood of fluid was discharged, and the abdomen collapsed rapidly, a fœtus not larger than the first joint of the finger escaped; the woman escaped the paracentesis and did well."—(Princip. and Pract. of Obstet., p. 78.)

The following amusing case was related to me a few years ago by a neighboring physician: "A young lady, whose abdomen became much enlarged, called upon Dr. B., a young physician, to ascertain the cause of this enlargement, as her condition caused numerous severe accusations from her friends. The doctor pronounced it a case of ovarian dropsy, and prescribed medicines that would *take it out by absorption*. The dropsy, however, got no better under his treatment, but rather increased than otherwise. The lady became dissatisfied, and concluded to send for another physician: accordingly Dr. H. was sent for. After an examination, Dr. H. was well satisfied that the lady was near *confinement*. And upon being interrogated by the lady whether it was dropsy, and if so, could he take it out? he remarked: 'madam, you undoubtedly *have dropsy*, and I see no other alternative, than it must *come out at the same place where it went in*.' And so it turned out, for in a few hours she was delivered of a *fine boy*. The lady has taken the precaution not to have dropsy again."

Percussion has also been relied upon as a means to ascertain the existence or non-existence of uterine pregnancy. "In order to become acquainted with the sounds we expect to meet with in our examination, we ought to be conversant with those produced by striking gently with the tips of the fingers against substances corresponding in texture and consistency with the parts we wish to detect. If we strike in this way gently upon the cheek, having previously inflated the mouth, we shall perceive a very sensible difference between the sensation felt and sound emitted here, and those observed on percussing the soft or fleshy part of the thigh or calf of the leg; the former giving us at once the idea of having struck upon a soft bag distended with air, whilst from the latter is emitted an obtuse, dull sound, indicating the substance beneath to be solid, but soft. Again, let us observe how much different is the sensation felt, and what a very peculiar sound is produced by striking the cranium, or superficial part of the tibia, and what a decided contrast this bears to both the others; the sensation and sound here inform us that a dense, dry, and hard substance has been struck. In the unimpregnated female, and in the impregnated in the early months, percussion produces the first mentioned sensation and sound, which is more or less tympanitic over the greater part of the abdomen, according to the quantity of air contained in the intestines. There is a modification to be met with in this tympanitic sound, depending upon the coëxistence of fluid with air in the bowels, which Piorry denominates *humorique*. As the uterus rises out of the pelvis, immediately over this region we have a sensation and sound, more or less modified, resembling those produced by striking the calf of the leg or thigh, in connection with the tympanitic sound. As the uterus enlarges, the extent over which these sensations and sounds are observed increases, as also do the sensation and sound, but the tympanitic diminishes. In the advanced months, a dry, dense substance is perceptible, and becomes more and more so the nearer pregnancy is to a full period. They can be generally produced by percussing the most inferior part of the uterine tumor, just above the pubis, where the head of the fœtus, which produces the phenomena in question, is most generally situated, at times being more perceptible on the right or on the left side, according as the head is placed. They are not always, however, confined to the lower part of the tumor, but may be detected at its upper part, when the head is situated there, as in breech or feet presentations. The head can frequently be distinguished by manipulation through the distented parietes; thus corroborating the evidence we arrive at by percussion.

Certain *motions* of the child have been considered elsewhere, such as were sensible to the individual herself, and also those ascertained on a vaginal examination. Those ascertainable to the accoucheur through the abdominal parietes, now demand some attention. These motions may be either active or passive. The first can only occur when the child is alive and capable of inherent vital action; the latter may be produced whether the child be dead or alive, by any cause capable of altering its situation *in utero;* such as change of position on the part of the female, the effect of the child's own gravity, or external force applied so as to displace it. The active motions of the child may be ascertained by first placing the female on her back, with the shoulders elevated, and the legs drawn up so as to relax the abdominal muscles. Then place the hand over the uterine tumor, and make slight pressure with the ends of the fingers; thus, a sudden jerking motion may be noticed at some part of the tumor, caused by the change in one or more of the extremities of the fœtus. This motion will be stronger or weaker in proportion to the age and strength of the fœtus, and the space the limb has to pass through before it comes in contact with the walls of the uterus. They are more distinguishable in advanced than in early pregnancies. If the active motions of the child are not detected in this way, dip the hands into very cold water, and suddenly apply them to the abdomen as already explained, will generally enable us to detect them. Both methods will, however, often fail, and we shall not be able to detect them by any means whatever. Although the active motions of the child are more to be relied on than the sensation of quickening or child's motions as perceived by the female, yet it is even possible to be mistaken as to the movements of the fœtus by an examination through the abdomen. This mistake may depend upon the sudden passage of flatus from one portion of the intestines to another, spasmodic action of the abominal muscles, of the uterus, or of certain fibres of either, and the pulsations of the aörta, especially if it be irregular.

The passive motion of the fœtus *in utero*, denominated by the French, *ballottement*, depends, as has already been stated, upon external causes acting mechanically upon it; the gravity of the fœtus by the female changing her position may produce it; or by the fœtus moving like an inert mass within the cavity of the uterus, the motion being sensible by the impulse communicated on the child's falling against the sides of the uterine cavity. To detect this, take the impregnated female during the fourth, fifth and sixth months, and place her in an erect position, then insinuate the finger within the vagina, and place the end of it against the body of the uterus, whilst the other hand is placed upon the uterine tumor above, and suddenly percussing the uterus, the fœtus will be felt to recede from the finger, and again fall upon the uterus where the finger rests. This tilting up of the fœtus *in utero,* is termed by the French, *abattement*, and is acceded to by Dr. Kennedy.

Kennedy recommends that the female should be examined in a reclined position, and placing the fingers of both hands spread out against the lateral parts of the abdominal tumor, and suddenly pressing upon it, first upon one side and then upon the other, a sensation will be experienced of a solid body falling against the sides of a membranous bag containing the liquor amnii, in which it is partially suspended. By this method of manipulation the accoucheur is more apt to be led astray than by the former, yet, both are liable to exceptions. Great tension of the abdominal muscles, by binding the uterus back against the spine, may prevent our detecting or producing the passive motions of the child. Extreme abdominal distention from air in the intestines, fluid in the cavity, or cellular tissue of the integuments, or even fatty deposit in this part may produce the same effect. A sensation resembling *ballottement*, in some respect, may be produced independent of pregnancy; such as ascites combined with abdominal tumor, particularly if this were movable; such, for instance, as fatty tumors of the mesentery, or tumors attached to any of the floating viscera.

Notwithstanding, *ballottement*, when skilfully performed, in detecting the fœtus *in utero*, is a most valuable sign, and may be regarded, when the sensations are felt, as a positive evidence of pregnancy. Dr. Montgomery regards it " when distinctly felt, a proof positive of the fœtus in utero."

Dr. Maygrier remarks: " This phenomena, so wonderful in its effects, not only demonstrates the certainty of pregnancy, but also that the child is alive, since a dead fœtus never responds as promptly and lightly to the motions impressed upon it."—(Mid. Illustrated, p. 89.) However, a great many difficulties attend the performance of this operation, such as depth and contraction of the parts, extreme irritability of the individual to be examined, the pain often experienced, and the absolute impossibility of prevailing upon the delicate-minded or irritable female to submit to what they look upon as an indecent and revolting ordeal.

(*To be continued.*)

ART. II.—*Cases Illustrating the Practice of Medicine in the counties of Rusk and Panola:* By JAMES E. SMITH, M. D., of Pine Hill, Rusk County, Texas.

WAS called on the 25th of June, 1852, to see a negress, the property of Moses Boynton, Esq., of Panola county, aged 45 or 46. She had been subject to scrofulous indurations about the cervical region, for about two years, which had, in the last six months, gradually suppurated, and were now large ulcers, of an indolent character, on both sides of her neck. Her general health was very bad, as shown by the great emaciation of the muscular system, deranged digestion, torpid bowels, inactive liver, etc., etc. There were also some hysterical symptoms present. Mr. B. had given her for the past year, "Janes' Alterative and Sanative Pills," "*usque ad nauseam*" without any relief to the scrofulous disease, or amelioration of her condition whatever. She had not been under the care of any physician previously.

With a view to improve her digestion and general health, I prescribed: ℞. Blue mass, rhubarb, *a a*, grains xxiv; ipecac., grains vi: Mix, and make 24 pills. Also, ℞. Compound extract colocynth, grains xxx; ext. hyosciamus, grs. xx; oil cinnamon, grs. xx; ipecac., grs. v: Mix, and make 30 pills. Directed 4 of the mercurial pills every third night, and in the intervening periods, from 2 to 4 of the vegetable pills to keep the bowels regular, and to insure the aperient action of the blue mass; also, a nutritious diet, and to apply emollient poultices to the ulcers every night, and to cauterize them freely around the borders every morning with nitrate of silver in substance.

July 10th, 1852. Patient better, digestion improved; bowels regular; appetite good; skin clearer and of a healthier hue. The ulcers have lost that unhealthy, *flabby* appearance, and have assumed a more florid, granulating character, the discharge of pus is also considerably less. Prescription: Bowels to be kept regular by the vegetable pill; discontinue mercurial pill, and take a fluid drachm of the following, three times a day, two hours after each meal, in sweetened water: ℞. Iodide of potassa, grs. 96; camphor water, ℥iv. Directed the nitrate of silver and poultices to be discontinued, and for a local application, use the following: ℞. Iodide potass., ʒii; iodine, ʒi; water, ℥viii. Mix, and apply morning and night; ulcers to be kept from the air, by having a greased cloth constantly to them.

July 25th. Was unable to take the medicine in the doses directed; had taken it in half the quantity; ulcers improved; general health better. Prescription: Gradually increase the medicine to two tea-spoonsfull for a dose, if possible, and continue the local application.

August 12th. Was requested to visit Rachel, (the negress); was informed that the ulcers were nearly well, but that she was badly salivated. Found her mouth very much ulcerated; profuse salivation; the saliva running almost in a constant stream, as it were; ulcers very much improved and healing fast. Prescription: Discontinue all the medicine on hand, and use, six or eight times a day, as a wash and gargle for the sore mouth: ℞. Tannin, ʒiv; water, ℥viii. Make solution. Nitrate silver solution, (2 grs. to the ounce of water,) as a local application for the ulcers externally. She grew rapidly better under the use of carb. iron, cinchona and tinc. iron in bitter infusion.

Her mouth, and also the ulcers got entirely well in three or four weeks. With the exception of a slight attack of "chill and fever" in 1853, she has had uninterrupted good health to this day, (March 27th, 1857.)

February 13th, 1855. Was called to see a negro boy, Simon, the property of Moses Boynton, Esq. This boy, the son of the negress, Rachel, is a large, stout negro, aged 28 or 30, blacksmith by trade. He had been hired out 18 or 20 miles from home, was sent home on account of his inability to work for the present. Says he has been sick for four or five months, though bad only for a few weeks. Present condition: large ulcer on the right cervical region, under the angle of the jaw, discharging a white, creamy-looking pus or matter; indurations on the corresponding side; these are very sensitive; has also an ulcer on the parietes of the abdomen, and another on his back between his shoulders. These ulcers he said had been on him for four or five weeks, and commenced like a common abscess or boil; were lanced as soon as fluctuation was perceived in them, but instead of getting well, they had to this time gradually enlarged. No indication was present of granulations of a healthy character; on the contrary, they were pale and flabby, and the pus was of a thin, flaky appearance. The ulcers or abscesses on his abdomen and back, were not of so well defined a scrofulous nature as the one on his jaw, or neck rather; the latter had the everted edges and hardened base as well as all other peculiarities so characteristic of scrofulous ulcers in that locality. In addition to the ulcers which I have attempted to describe, he had an affection of the skin of 8 or 10 years standing, which consisted of little patches of very troublesome sores confined to his armpits and groins. Sometimes this latter affection would be entirely well, and in a few days at its height again, simulating porrigo or some of the multitudinous forms of impetigo. His appetite was only slightly impaired, digestion tolerably good; bowels slightly costive; skin dry; circulation 85, languid. Prescribed the same vegetable pill as in Rachel's case—one before each meal, for a few days. Iodine liniment to the ulcers, followed by slippery elm poultices at night, and also to take three grains of hydriod. potassa three times a day.

March 24th. Ulcer on the back and belly much better; the one on his jaw about the same. Continue treatment, only increase the potassa to 4 grains a dose, and cauterize ulcers.

April 14th. Ulcers on the back and belly nearly well; the one on his neck decidedly better. Continue treatment with the addition of 4 grs. of hydrated oxide of iron after each meal.

May 30th. Ulcers healed up; skin "slick and greasy;" says he feels like a "new nigger." Prescription: ℞. Precip. carb. iron; powdered gentian, *a a* ℥i; orange peel, ℥ss; best port wine, 1 quart. Dose, a table spoonful after each meal, shaking well before using.

June 26th. Simon is still well; no sign of the ulcers or of the skin affection; he has regained his health entirely, and since the fall of 1855, has not lost a day from work until the last twenty days, May 28th, 1857; the skin affection has annoyed him some, but it is yielding to a mild course of alteratives, viz.: to small doses of iod. potass and sarsaparilla internally, and zinc lotions externally.

February 1st, 1854. Mr. Laird Fleming to-day brought his negress, Clara, to my house, for medical treatment; aged 12 years. She had been in extreme bad health for the past year. Present condition: very much emaciated and feeble; slight fever of an evening, followed by copious diarphoresis, skin afterward very dry and harsh; tongue loaded with a yellowish coat; pulse habitually 100 to the minute, and of the peculiar thrilling character indicative of chlorosis; bowels irregular, sometimes costive, then again the opposite condition prevailing. In addition to the symptoms enumerated, there was a hardened, indurated state of the cervical glands; they were very sensitive and sore, and slightly inflamed, though no evidence of fluctuation, or other symptom, leading me to suppose that there was any pus already formed. There was an ulcerated state of the tonsils and inflammation of the uvula, as well as an elongation of it, the irritation of which kept up a constant cough. She could not speak above a whisper, neither could she breathe through her nostrils. Prescription: ℞. Blue mass, grs. ii; ipecac, gr. i; carb. sodæ, grs. iii. Make into a pill and give it, and repeat every three hours until three doses are taken; apply solution of the nitrate silver to the throat, of the strength of 4 grains to the ounce of water.

Feb. 2d. Medicine had operated gently on her bowels, the discharges fœtid and very bilious. Prescription: ℞. Sulph. quinine, grs. xx; aromatic sulph. acid, gtt. x; water f℥ii. Make solution. Directed her to have a tablespoonful every two hours during the morning, until all was taken.

Feb. 3d. Patient better, missed both the fever and the profuse sweat, although her skin was gently moist all the time. Still under the influence of the quinine to some extent. From the use of the caustic, the ulcers and inflammatory action in her throat were slightly improved. The uvula being still disagreeably elongated and tonsils enlarged, I this morning excised the uvula and also the right tonsil; applied a saturated solution of nitrate of silver to the throat; prescribed syrup of iodide of iron in doses of ten drops, three times a day, two hours *before each meal*, and 2 grains of iron, an hour *after each meal*. Bowels to be regulated by the compound colocynth pill when indicated.

Feb. 7th. Patient gradually improving. She can speak more audibly, begins to look better, has considerable appetite. Directed 15 drops of the iodide three times a day; also increase the hydrated iron 4 grains at a dose.

Feb. 17th. Patient improving very fast; indurated condition of cervical glands considerably lessened; voice more distinct, tonsils well; has gained flesh, and has an inordinate appetite and good digestion. There is, however, an ichorous discharge from the nostrils, neither can she smell anything, nor breathe through them. I this morning introduced Bellock's instrument for arresting hæmorrhage from the nose. The smooth, convex extremity of the canula forming the head of the instrument, being introduced as far as the naso-palatine septum, and the spring being pushed forward, the curved extremity of the canula readily found its way into the mouth, a ligature made of slackly twisted cotton thread, with a small plug attached, was passed through the eye of the instrument; this plug, as well as the ligature, was saturated in a strong solution of nitrate of silver, and gently drawn through the entire nasal cavity. Both nostrils were subjected to the operation. In the evening I reäpplied it.

Feb. 19th. Discharge from nasal cavities lessened to some extent; she can speak more distinctly, and can smell and breathe through one nostril; canterize the nasal cavity again; continue treatment.

I cauterized the nose every few days, and she recovered the use of one nostril; the other gradually got well, though she can neither smell nor breathe through it. A curious peculiarity of this case was and still is, that she could expel air through her nose, but could not inspire it. She was kept under the use of the syrup of the iod. of iron for three weeks longer.

She has had good health to this time, and is now a large, well-grown, likely negress; and with the exception of a slight attack of irritative fever upon the establishment of her menses, has not been sick a day since.

May 28th, 1857.

ART. III.—*Speculative and Practical Researches into the Natural History of Cholera.* (Continued from Volume XIII.) By BENNET DOWLER, M. D.

GENERAL REMARKS.

THE present nomenclature of cholera is not very satisfactory. The French adjective, *cholerique,* is now often used in that language as a substantive to denote a person affected with cholera, and might be adopted as more convenient than the double substantive, *cholera patient*. *Choleraïc* is gaining ground daily, as an English adjective, as choleraïc stools, choleraïc symptoms, choleraïc subjects, etc. *Choleric* has long been appropriated as the synonyme of rage or fury. Circumlocutions, which clog the wheels of language are not desirable. These remarks are made in this place, because the terms alluded to, may, perhaps, occur in the sequel.

The term *cholerine*, is not only an affected refinement, a distinction without a difference, but it is an illusion fraught with danger in a practical point of view, especially during an epidemic. In the Supplement to the Dictionary of the French Academy, this word is defined thus: "CHOLÉRINE. *Nom donné à la diarrhée ordinaire*, depuis l'apparition du choléra asiatique en Europe." Dr. Harris, in his Medical Dictionary, says: "CHOLERINE, a slight diarrhœa during the prevalence of cholera—a premonitory symptom of the disease." Dr. Dunglison's definition is: "CHOLERINE, a diminutive of cholera. The first stage of epidemic cholera; also the premonitory symptoms of cholera."

Cholerine is cholera or it is not. If cholerine be but an "ordinary diarrhœa," or "a slight diarrhœa," let it be so called. If it be "the premonitory symptoms of cholera," and still more, if it be "the first stage of epidemic cholera," *cholera it is.* A most fatal error, which has slain its thousands, nay, hundreds of thousands, is the popular belief that the first stage of cholera is not cholera but an "ordinary," "slight diarrhœa."

To propagate the doctrine that a patient in the first stage of cholera is not affected with cholera but something else, even cholerine, can hardly fail to extend this error. Cholerine is a pernicious neologism, full of perfidy, reservations, equivocations and mortal falsehoods, of which, however, the able lexicographers quoted are innocent.

The plan of these papers on cholera, includes neither a systematic attempt to produce a treatise, nor an exhaustive analysis of any special branch, speculative or practical, concerning this malady.

Before proceeding to post-mortem examinations, it may be proper to enter upon the investigation of some speculative and practical topics.

If the reader should find suggestions where probabilities might be hoped for, and probabilities where demonstrations are desiderated, let him give thoughts, facts, and deductions more satisfactory concerning the great plague, the "black death" of the nineteenth century. The obscurity which envelops the career, pathology, treatment and pathological anatomy of this disease, affords the best reason for further inquiry. Whatever miscarriages may occur in the reasonings which follow, it is believed that the facts reported are correctly stated.

Symptomatic, therapeutic, and post-mortem histories made on the spot, and in the presence of the phenomena recorded, may not be perfect, but they will be vastly more accurate and valuable than the fleeting, dim representations of the most retentive memory. It has been truly said by Gray, the poet, that "memory is ten times worse than a lead pencil. Half a word fixed upon or near the spot, is worth a cart-load of recollection. When we trust to the picture that objects draw of themselves upon our mind, we deceive ourselves; without accurate and particular observation, it is but ill-drawn at first, the outlines are soon blurred, the colors every day grow fainter, and at last, when we would produce it to anybody, we are forced to supply its defects with a few strokes of our own imagination."

THE CHOLERAÏC STOOLS.

It has been asserted that the epithelium of the Lieberkuhn's glands or mucous crypts, which desquamate in the choleraïc liquid, give it a whitish appearance. Although this exuviation of the epithelium of the intestinal mucous membrane, may contribute to or constitute a part of the whitish appearance of the choleraïc liquid, yet the homogeneous. uniform, non-flocculent aspect which it often displays, seems to be peculiar, resembling, if not identical with chyle diluted with lymph and serum.

"The stools in Asiatic cholera," says Prof. Lehmann, "have been submitted to many analyses, which, however, have led to few results, insomuch, as the simultaneous character of the blood and of the cholera process in general, have not been taken into consideration. The only peculiarities which we find in the stools in cholera, are shreds of cylindrical epithelium, an extraordinary quantity of water, a little albumen, very little biliary matter, and a relatively large amount of salts, amongst which, according to the evidence of all observers, the chloride of sodium predominates, and often to such a degree, as to exceed in amount all the organic matters."—(*Physiol. Chem.*, i, 539. Phila., 1855.)

Prof. Lehmann's assertion that "the rice-water appearance of cholera stool, simply depends on the suspended epithelium," is entitled to great weight, coming from so high an authority; yet, as already indicated, it seems far from being universally admissible, judging from merely physical appearances. Epithelial *debris* and shreds in the stools give a whitish hue, without doubt, while the serosity in which they are suspended, is sometimes nearly limpid, yet in most cases, there will be found an uniform, slightly opaline liquid, resembling a mixture of milk and water, or chyle, lymph and water, with or without suspended flocculent, shreddy *debris* of the mucous tissue.

Is it not probable that a retrograde action or exosmotic flow of chyle and lymph takes place in cholera? May not the shreddy matter itself be albumen or lymph coagulated by the gastric juice or accidental acids? In cholera infantum, cholera morbus, diarrhœa, and dysentery, the mucous epithelia discharged in the stools do not give the whitish appearance of choleraïc liquid. Some eminent pathologists contend that the stools of cholera patients contain no albumen. In the epidemic of 1848–9, in New Orleans, the experiment of boiling, as made on several occasions by myself and others, showed the coagulability, that is, the increased whiteness, opacity and turbidity of the liquid found in the bowels a few minutes after death. The physical appearance of this liquid resembles that which is often met with in albuminuria with the dropsical effusion. After the liquid drawn off in ascitis has been heated to the boiling point, it loses its transparency, becomes uniformly white, and affords analogous, though exaggerated appearances, as compared with the most intense whitishness met with in the choleraïc liquid. In certain cases of albuminuria, there is nothing more than mere milkiness, while in other cases I have found a soft, coagulated mass figured by the containing vessel, and contracted like the clot which forms in the serum of the blood. During convalescence it sometimes will be seen that this whitish liquid is much inspissated. It may be coagulated or semi-solid.

In some cases of suddenly arrested cholera, a large quantity of liquid may be detected by the touch in the bowels. This choleraïc effusion, however, gradually disappears with the returning powers of intestinal absorption. The convalescent may be for a time constipated; the first evacuations may be of various colors, or they may be inspissated and whitish, as already mentioned.

Whether the choleraïc liquid be in part a reflow or effusion of chyle from the thoracic duct and its branches, or from the lymphatics, or an albuminoid serosity from the capillaries, or a product *sui generis*, I will not pretend to say; nevertheless, it does not appear to receive its color wholly from shreds of epithelium. I have, in this disease, but I believe never in any other, found this liquid in the pelves of the kidneys, sometimes in the fallopian tubes, in the corpora lutea of the ovaries; but after sudden death without reäction, it is found almost always in the bladder, though in small quantities, varying from ten to fifty drops, more or less, being more concentrated or milky ,and less watery than the liquid usually found in the bowels. It is true that epithelia exist in these organs too, but if their exuviæ could produce a white liquid like that found in cholera, such liquid would often, if not constantly, be expected in all bodies, and the more so as the exuviation of the epithelium is a normal and constant physiological process, probably more active than the exfoliation of the epidermis. The inner layer of the mucous surface is thus thrown perpetually off into the canal as effete, by the subjacent layer which takes its place. The metamorphosis and renewal is constantly going on during life. In some forms of disease, particularly in such as produce a flux from the bowels, these *débris*, shreds, and membraniform exfoliations abound, indicating a morbidly active condition, the waste in the economy exceeding the repair.

It is possible that cholera might prove fatal without either vomiting or purging. Thus, M. Cruvielhier mentions a case, in his *Livraison* on cholera, that of a pregnant woman, near the period of her confinement, who had, on the day of her death, all the symptoms of cholera, except vomiting and stools; she was blue, cold, cramped, etc., for two days before her death. After death, the large intestine was found enormously distended with rice-water liquid. The quantity of liquid which the bowels may contain without risk of rupture or excessive distension is enormous. I have injected in the dead body eight pints of liquid in the lower third or fourth of the bowels, that is below the valve of the cæcum, which merely filled the cæcum, the colon, and rectum. Now suppose that the residue of the bowels, including the stomach, should contain twenty-two pounds, in all thirty pounds, there will then be, perhaps, three or four times more choleraïc liquid parted from the blood, than will suffice to bring on fatal collapse.

In fact, it has been asserted that collapse has supervened, and that death has taken place without any choleraïc evacuation, and without any cramps having taken place. Some have called this *dry* cholera, thunder and lightning cholera, death being caused, as they affirm, by innervation! But these mysterious words, vaguely applied to a doubtful thing, having, perhaps, no existence but an imaginary, undefinable one, afford an unsatisfactory explanation, not confirmed by autopsy. It is highly probable in all of these cases, assuming them to be true, that a post-mortem examination would have revealed abundance of choleraïc liquid in the alimentary canal, though none had been discharged, owing to some unusual cause, as spasmodic contraction of the sphincter ani, or some portion of the intestine, not to mention the possibility of intussusception, all of which I have witnessed in the living or dead.

Hence it may be inferred that the mechanical methods of arresting the choleraïc discharges, which, according to rumor, have been sometimes adopted, must fail. In 1842, a gentleman formerly of Havana informed me that during his residence in that city, while the cholera was prevailing, in one of the hospitals where certain medical students or bachelors of medicine were appointed to render medical services to choleriques, a debate arose upon the propriety of forcibly stopping the anus by means of corks, and that the question was decided in the affirmative. It was concluded that death was caused by the enormous discharges, which mechanical means might arrest. It was tried but the result was not known to my informant, but may readily be imagined. A more plausible method there is reason or at least a rumor for believing was tried a few years ago in New Orleans, namely, the plugging of the rectum and anus with medicated cotton. If, however, the closure of the anus could be completely effected, hermetically sealed, there would remain ample room in the bowels for an enormous quantity of the choleraïc liquid, while an invetted peristaltic action of the alimentary canal would be likely to empty itself by the mouth, as hernial and other mechanical obstructions prove.

CARBON. CARBONIC ACID. BILE.

The agency of carbon, carbonic acid, or hydrocarbon, upon the rise and progress of cholera asphyxia, is probably paramount. Whether this be the cause or effect of the disease is not known, though this agent must be deleterious, whether its action be primary or consecutive. Hence, a few remarks, though, in part speculative, may be allowable in the absence of an established theory of the causation of cholera. Why should probability be rejected, because certainty is as yet unattainable? If the causes of phenomena be veiled, the phenomena themselves must be accepted as objects of study, instead of the former. If the first link of the chain cannot be traced, this is no reason why the whole chain should be tumbled into a confused heap, and be abandoned in despair. It should be straightened out. It may serve the purpose of a cable, wherewith to make fast while exploring the uncertain coasts of ætiology.

If all other means of accounting for danger or death in cholera were to fail, the actual or the virtual asphyxia which characterizes this disease, would, to a great extent, afford a satisfactory solution. Blood is the carrier of oxygen, and as it is but partially oxidated or arterialized in the respiratory process, in cholera, it is unfit for, nay, poisonous to the entire animal economy, as carbonic acid is known to be. The bluish tint of the surface of the body in cholera, often surpasses that which is seen in fatal asphyxia and strangulation by hanging. In this disease, the physiological equilibrium between arterial and venous blood no longer exists, the normally thin blood is replaced by thick, red by black, oxidated by deoxidated. But even if the blood were thoroughly oxidated, deoxidated, and oxidated again in the lungs, its quantity being diminished while its viscosity is increased by the choleraïc discharges, and its circulation therefore impeded; its power, as a carrier of oxygen, must be proportionally inefficient. Here the quantity of oxygen and the number of its carriers are diminished throughout the circle of the organs, from the centre to the periphery, and, consequently, the carbon is not parted from the economy in the normal degree and manner.

"Liebig calculates that an adult male, taking moderate exercise, loses 13.9 ounces of carbon daily from the lungs and skin. In order to convert this large quantity of carbon into carbonic acid, 37 ounces of oxygen must be absorbed during the same period by the lungs and skin; but this estimate is doubtless too high."—(Todd and Bowman, *Phys. Anat.*)

The absence of bile in the choleraïc excretæ is a very significant fact. The non-elimination of this hydro-carbon from the liver, that is, this absence of bile, in connection with the probable inability of the lungs to part the carbon from the animal tissues, and particularly from the blood in the pulmonary circulation, all go to explain the dark color of the skin and blood, and the impending danger and mortal tendency of this disease.

Experimental physiologists have estimated the quantity of bile in health, at three or four pounds per day! Prof. Carpenter quotes and adopts the experimental conclusions of MM. Bidder and Schmidt, who affirm that the daily amount of bile secreted by man is not less than 56 ounces. Only the sulphuretted and effete part of this bile is, however, excreted with the fæces, the residue being depurated, is presented to the absorbents, reëntering the economy by the lacteals, is supposed to aid in the assimilative processes for the making of sugar, fat, and blood, contributing to general nutrition.

The non-secretion and non-excretion then, of so large a quantity of hydrocarbon, must, it is reasonable to suppose from analogy, exercise a deleterious effect upon the animal economy, particularly upon the blood, giving rise, in part at least, to the symptoms which have conspired to give this disease the characteristic name of cholera asphyxia. This name, however, has a more special and appropriate connection with the deranged functions of the respiratory organs. The imperfect manner in which respiration proceeds in cholera is remarkable, though it seems to have attracted little attention, either as a symptom or as a chemical phenomenon.

Prof. Lehmann quotes the following statement from Doyère, "who repeatedly examined the air expired by a young girl that had cholera, and continued his observations till the death of the patient; he found that the excretion of carbonic acid was generally much diminished in this disease, and that this excretion was augmented as soon as the general condition of the patient improved."—(*Phys. Chem.*, ii, 471.) This result, though not sufficiently established by a single case, is confirmed by analogical reasoning, as neither the full oxidation of the blood, nor the complete elimination of carbonic acid conld be expected to take place in the lungs in fully developed cholera, inasmuch as these organs are comparatively torpid; respiration is small and quick, not full; the chest neither expands nor collapses, as in healthful inspiration and expiration. The lungs are often found collapsed, as if they had been paralized or had fallen into comparative disuse before death.

The failure or obstruction of the general, and more especially of the pulmonic capillary circulation, must necessarily prevent the oxidation of the blood, the common carrier of oxygen to the nervous and every other tissue, from the centre to the circumference. It is probable that the material cause of cholera first acts on the blood in the lungs, and through the blood on the whole system. Whether this cause primarily tends to produce carbonaceous deterioration, or whether the latter is secondary in the progress of the disease, may be questionable, but the physical change giving the periphery of the body a dark, cyanosed hue, is not a matter of doubt. This dusky, cernlian, or leaden tint, is more pronounced in many cases of cholera, than it is found to be in the features of executed criminals just after having been hung.

CONJECTURES ON URÆMIA AND ENDOSMOSIS IN CHOLERA.

Cholera is probably due to a single cause or simple poison, which, however, being as yet unknown, except through its mere phenomenal history, it becomes necessary to adopt another view of the causation of the disease, whereby the primary symptoms virtually become the cause or causes, though really effects only. Morbid as well as physical causes may be simple or compound. Thus several causes may jointly combine to produce an effect which neither can produce *per se*. For therapeutic purposes, at least, the primary symptoms and the cause of cholera must be viewed as identical.

With the first choleraïc discharges, the urinary secretion begins to diminish, and as the disease progresses, it is wholly suppressed. Now this suppression, though an effect of an unknown antecedent, is not for that reason the less important.

The poisoning of the system from non-excreted urea or some of its intercurrent combinations with other elements in the blood, giving rise to uræmia, constitutes a branch of pathology, which is at least, suggestive, in relation to cholera, and deserves further investigation, and the more so, as the specific cause and the primordial mode in which this cause acts upon the economy elude observation.

Prof. Lehmann says that " the rice-water matters vomited in cholera, both in their physical and chemical properties, are almost perfectly identical with the matters often vomited in uræmia; they are usually of a faint, sickly odor, and their reäction may be either acid, neutral or alkaline; on standing, they deposit grayish-white flakes, consisting of epithelial structures or intestinal mucus, while the fluid above, appears clear and yellowish, containing a relatively large amount of inorganic salts, and especially of the chloride of sodium. For a short time after the beginning of the disease, the vomited matter is acid, and I found in it, as Hermann had done, butyric and ascetic acids. When the fluid contained no remains of food, but resembled rice-water, and was acid or neutral, I constantly found urea, and can thus confirm the observations of Schmidt. If, on the other hand, the disease was further advanced, and the cerebral symptoms accompanying uræmia had set in, and if vomiting now came on, salts of ammonia, and especially the carbonate, were found, and hence the fluid had an alkaline reäction. Albumen occurs only in very small quantities when the fluid is acid, but in larger quantities when there is an alkaline reäction."—(*Phys. Chem.*, i, 529.)

The non-secretion and non-excretion of urine in cholera is a very prominent, significant and constant phenomenon. The secretion of urine, in health, amounting to nearly three pounds per day, is generally regarded as a dupuration of the blood, including effete, nitrogenous, carbonaceous, excrementitious salts and substances, amounting in health to several hundred grains of solid matter daily, the retention or non-elimination of which could not fail, analogically speaking, to prove deleterious. If these matters should not directly poison the blood, they might be expected to irritate the capillary, nervous, muscular and mucous tissues. It is possible that uræmia may be the forerunner or even a cause of cholera. The sudden and complete suppression of urine, affords a presumption, in the absence of satisfactory proof to the contrary, and in the absence of any specific known cause of cholera, that the uræmic poisoning may exist, either as the precursor, cause, or intercurrent effect.

The complete absence of urine in the urinary bladder, as proved by the catheter, during life, and by examination after death, can scarcely be accounted for, without supposing that this fluid has been sometimes resorbed from the bladder as fast as secreted by the kidneys anterior to its total suppression, otherwise, a quantity, how small soever the secretion may have been before the stage of collapse, would be found; instead of which, very often there is not a drop. Sometimes, or rather in a majority of choleraïc cadavera, a few drops of milky liquid are found in the bladder, kidneys and ureters, having neither the color, odor, nor appearance of urine. It may be doubted whether the voluntary emission of urine in health, can so completely empty this organ, as it is found to be in cholera. The resorption of urine which may be in the bladder at the inception of cholera, or that may be secreted during the early stage of the disease, if proven, would afford two strong presumptions of high import, namely, the probability of uræmic poisoning from this source, and next, the probability that medicinal solutions might, in like manner, be taken up and carried into the circulation, without which, a remedy, how efficacious soever it may be, in general, can avail little or nothing in this malady.

Pathological chemists acknowledge that with their present means of research, it is difficult to appreciate the uræmic condition of the blood. Lehmann says: "Physiologists were long undecided regarding the seat of the actual formation of urea. Since urea had not been discovered in the normal blood, many believed and they still adhere to the old view, that the excreta are formed in the excreting organs from the constituents of the blood, and that urea is thus first produced in the kidneys. They accounted for the circumstance that urea is, in certain morbid conditions, sometimes found in the blood and other fluids, by assuming that it was then resorbed from the kidneys and urinary bladder. To overthrow this opinion, Prevost and Dumas, aud, subsequently, Gmelin, Tiedmann and Mitscherlich, extirpated the kidneys of animals, and then found no inconsiderable quantity of urea in the blood; indeed, Marchand induced all the symptoms of uræmia in a dog, by the mere ligature of the renal nerves, and was able to recognize the presence of urea with the greatest certainty, not only in the blood, but also in the vomited matters.

"The investigations of Marchand have thrown much light upon this subject; this accurate observer could only recover 0.2 of a gramme of urea from 200 grammes of serum, to which 1 gramme of urea had been added; he shows that, even if the urea were only separated from the blood at the end of each successive hour, it could not have accumulated in such quantity as to have been discoverable by the present mode of investigation. The following consideration will give us an idea of the small quantity of urea, which, according to Marchand's hypothesis, at the most, that can accumulate in one hour. From the experiments of Ed. Weber, which I have in part confirmed, we may assume that there are in an adult man, at most, 6 or 7 kilogrammes [16 to 19 pounds] of circulating blood; now, if in 24 hours 30 grammes of urea are discharged, at most only 1.25 grammes could accumulate in one hour in the whole mass of the blood. This minute quantity can, however, only be detected in operating on very large masses of blood, and by the aid of the microscope. If we should inquire—from what substances is it produced, and what tissues principally contribute to its formation? we could not, in the present state of our knowledge, give any satisfactory answers to these questions."—(*Phys. Chem.*, i, 155–6.)

"Urea constitutes nearly half of the solid matter of healthy urine; a large proportion of urea is derived from the disintegration of the tissues by the process of secondary assimilation. There can be little doubt that urea is formed in the blood by the action of oxygen upon lithic acid, creatine, and, possibly, upon some of the matters comprehended under the indefinite term of extractive matter. In cases where the expiratory function is impaired, the amount of uric acid has been found to be abnormally increased. There appears ample evidence to show that lithic acid is one of the purely excrementitious substances derived from the disintegration of the tissues, and formed by the action of oxygen upon effete material. *Urea has been detected in the blood of patients suffering from cholera.*"—(*Phys. Anat.* Todd & Bowman. 1857.) Simon says "that in the blood of choleraïc patients, he and others have found urea."—(*Chem. Man.*, 265.) Vogel affirms that "in healthy blood urea occurs in such minute quantity, as scarcely to admit of detection."

It is true, that as yet, no remedy is known for this non-elimination or suppression. The secretion and excretion return with the subsidence of its associated or contemporaneous symptoms. As medicines given internally are usually not retained, or if retained, they are not absorbed, diuretics cannot be relied on. Seeing, therefore, as before suggested, that in severe cases of cholera, medicines are generally either vomited or washed away in the stools, might not the bladder and urethra become, to some extent, the media of medication for the general system? Might not medicinal solutions of morphia and the like, be introduced, retained, and absorbed? The violent exosmosis or transudation from the alimentary canal in cholera, affords no positive proof that either endosmosis or exosmosis is impossible in the urinary apparatus, and the more so, because this apparatus appears natural, though contracted from the absence of a distending body. This thickness of the parietes of the bladder in cholera is then, natural in the absence of urine. The bladder being empty, is contracted, and being contracted, it is, necessarily, thick and massive, but not, therefore, morbidly altered. This organ exhibits, out of the body, the endosmotic action with energy, being generally preferred for experimental purposes.

CHOLERAÏC ALGIDITY.

The cholera-producing cause induces a positive algidity of a very peculiar character, very little analogous to the common morbid influences of the privation of heat, from the low temperature of the surrounding media, as witnessed in the arctic regions, and in other cold latitudes, where, as in the campaigns in Russia, in 1812–13, under Napoleon I, hundreds of thousands perished amid the snows of Russia. The choleraïc cold, unlike merely physical cold, has no subjective reality; in the former, the patient feels even a burning heat, in the latter, cold only. Cold from the surrounding media produces both subjective and objective refrigeration; whereas, the pathological cold of cholera has, as already indicated, only one of these tests, namely, the objective, as proved by the thermometer and by the touch, while the subjective or senational criterion is wholly absent.

Both choleraïc and physical cold produce, according to their intensity, contraction and shrinking of the animal tissues; but in cholera, the contraction and shrivelling are probably much greater than in even congelation resulting from the abstraction of the animal heat. The condensation or hardness of a part thoroughly frozen, is, of course, wholly unlike anything witnessed in cholera.

Choleraïc cold probably diminishes the power of absorption, which cannot be said of physical cold within a certain limit, for in cold climates, digestion and absorption appear to be very active; in both, the capillary circulation is obstructed, and asphyxia is often witnessed, and great thirst also is common to each.

The cold of cholera is as great in summer as in winter. In the hottest weather the expired air from the lungs is often very cool, doubtlessly many degrees below that of the atmosphere or the body in health.

The absence of subjective algidity, that is, the absence of the sensation of coldness, has probably contributed to the underrating of this condition as an element in the ætiology and pathology of cholera. The objective validity of this algidity is, as all know, real, and may be tested by the thermometer, and being real, whether as an original or secondary element of cholera, it must, upon physical principles, exercise a powerful influence upon the economy; upon the capillary, vascular, cutaneous, glandular, muscular, and nervous systems, contracting and shrivelling the surface, and forcing the blood towards the more yielding centre, causing, it may be rationally supposed, a mechanical pressnre, whereby the thin or serons portion of the blood transudes through the mucous membranes.

That there is something peculiar in this coldness, not readily explicable upon merely physical principles, would seem reasonable, from the fact, which is often seen after death, namely, a rise of temperature, several, sometimes many degrees beyond that of health.

Dr. E. A. Parkes, of London, a few years since, maintained that "the proper and distinctive symptom of cholera, is a diminution of temperature of the whole body. The algid symptoms are, in fact, the disease; in proportion to them is the malignity and rapidity of the case; they afford the only measnre of its severity, and from them only can a correct prognosis be formed. Whence it follows, that vomiting, purging, and cramps, must be considered merely as usual but non-essential symptoms of cholera, whose absence would not in the least affect the diagnosis of the disease; and that, consequently, it is within the bounds of possibility, or even probability, that cases may occur entirely divested of these symptoms."

Dr. Monneret, who went to Constantinople in 1847, to study the cholera then prevalent, found that the disease run its course in from two to twelve hours in many cases; the temperature, when cramps occurred, fell in the axilla to 66° or 67° Fah. How can this refrigeration of the body be explained? Chemically speaking, it might be supposed that cntaneons transpiration, or sweating, and the secretion or excretion, or effusion of the choleraïc liquid into the alimentary canal, together with perspiration and evaporation from the skin, might reduce the temperature, as evaporation and liquefaction are known to do, by absorbing or rendering latent free caloric. As fluids in becoming solids, give out heat, so the solids in becoming liquid, or parting with the latter, absorb or render heat latent, so it might be supposed that the liquefaction going on among the solids, in cholera, would cause a rapid refrigeration, especially when it is considered that the great process of nutrition is not only arrested but reversed, and with it the creation or evolution of heat, during the apparently rapid emaciation resnlting from choleraïc discharges. The snpply of free heat is arrested; its waste augmented. The absorption of oxygen, nutriment, and medicine is diminished or destroyed, while a rapid, wasting metamorphosis or decomposing process takes place—a real decomposition, without the usual fermentation and fœtid gases and ordinary appearances, called putrefaction. Thus there is not only no assimilation, but an enormous and sudden waste—a process, similar in effect to that of withholding air and food from an animal, and at the same time extracting its blood rapidly.

This is rendered more or less probable by taking another route, namely, that of post-mortem observation. After death—after the morbid agent has done its worst—after the cessation of pathological waste, sensible and insensible perspiration, and choleraïc liquefaction or exudation, the heat very often, if not always returns, sometimes continuing for hours, sometimes reaching much higher than the normal standard, as may be seen by referring to my papers on animal heat in both living and dead bodies, reported *in extenso*, in this Journal. See vols. XII, XIII.

Admit provisionally, seeing no plausible explanation has been given of algidity in cholera, that animal heat is the resultant of a certain ratio of metamorphosis or nutrition in all of the animal tissues—or suppose that nutrition, repair, or composition is suspended in cholera, waste or decomposition vastly preponderating, and then, it will follow naturally, that coldness must ensue, with corrugation, contraction and collapse. Admit, again, that respiration is a refrigeratory process, that cutaneous transpirations in the form of vapor, sweat and clammy exudation, including serous discharges from the bowels, all have the same tendency, then, it will follow that, as these functions cease at death, heat might be developed for a time, provided the nutritive action does not wholly cease simultaneously with the wasting process which death arrests temporarily before putrefaction begins. Without dwelling upon the evidence of an analogical character, drawn from the vestiges of persisting physiological action found in cadavera after sensuous death, as witnessed in post-mortem muscular contractility, capillary circulation and the like, it is sufficient to allude to certain facts often seen in cholera cadavera, namely, diminished wrinkling and collapse of the skin of the fingers and of the whole body; also returning plumpness of the corpse, fulness of the veins, with, in some cases, an approximation towards the natural color of the surface, all of which suggest, if they do not demonstrate a remnant of reparative or vital action in the tissues, for a time after death has suspended the morbid refrigeratory action.

In any case, the respiratory origin of animal heat fails to account for its development, long duration, and the remarkably unique laws in many dead bodies, all being in contrast with the following exposition, so far as the respiratory theory of animal heat is concerned: "In every instance we assert that the production of animal heat is due to oxidation taking place in the economy, and giving rise to carbonic acid, and other collateral products. Although we cannot interfere with the rate of respiration, we can affect the quantity of air introduced into the system by artificial means, as in the operation of blood-letting; for, although, after blood has been drawn we may make the normal number of respirations seventeen in a minute, for each introduce seventeen cubic inches of air, we have diminished the number of discs, which are the carriers of oxygen; and, as the experience of physicians in all times has shown, there is no method so effectual in reducing any unusual or febrile temperature. So in like manner, in Asiatic cholera, the marble coldness which the body presents, is attributable to the loss of function of the discs, and consequent abatement in the quantity of oxygen introduced." (Draper, *Phys.*, 182, 184.)

The Newtonian law of the increment and decrement of heat, applies neither to recently dead, nor to living human bodies. The ratio of calorification and refrigeration of such bodies in a given medium does not follow, the physical law by which equal increments and equal decrements occur in equal times, until a calorific equilibrium is established. I have shown, by an immense number of experiments upon the healthy, diseased, and recently dead bodies, that this physical law does not hold good in the domain of physiology and pathology.

Suppose the human body to be immersed in water so that it shall be frozen into a solid mass throughout, and that the surrounding media shall arise to 100°, the body will rise in temperature, becoming heated from the surface towards the centre, in a certain ratio, until it shall correspond to its environments. But in cholera, this does not happen, for, however warm the weather may be, the patient's temperature is often more than 20° lower. On the contrary, although the weather or surrounding media may be below freezing, the dead body may, and often does arise to 100° and 110°, or 68° to 78° higher, which a human statue of stone or brass would not do agreeably to the physical law of caloric.

In cholera, free heat, in what form soever it may be applied, seems to become latent, as in the melting of ice, without permanently heating the mass itself. The hot vapor bath from burning alcohol, confined around the patient's body by the bed-clothes and a frame of hoops, appears to augment the sensible perspiration without augmenting the general temperature of the body. Hot baths and other hot bodies do not make the patient warm. A real heating would, upon physical principles, cause expansion, whereas the contraction or wrinkling of the body still continues after the artificial application of heat. The thermometer shows, also, that the abnormal algidity cannot be permanently removed by art in severe cases of cholera. This is one among many instances, showing that cosmical or physical laws are not always identical with those of vitality in sickness and in health. Nevertheless, these mutually illustrate each other.

Upon the whole, it appears that the extraordinary refrigeration which takes place in algid cholera, is explicable, to some extent, upon both physiological and physical principles. Sensible and insensible perspirations from the skin, together with a sudden *quasi* liquefaction or parting of fluids from the blood and solids, ought, upon theoretical principles, to produce refrigeration in the animal economy.

The physician, when called to see cases in which the arteries and veins have been cut, will often find, after almost fatal hæmorrhages, that violent vomitings and purgings, together with pallor, shrinking and coldness of the skin will have occurred. In these cases, as in cholera, thirst is excessive, and constantly augments with the loss of blood. Water! water! is the cry of the fallen, bleeding soldier on the battle-field.

In a word, let the cause of algidity be what it may, there can be no doubt whatever that its agency upon the gases, liquids, and solids, and their chemical and physiological combinations and conditions, must be great, paramount, dangerous. The application of cold to a healthful individual, so as to corrugate his surface, shrivel his extremities, and lower his natural temperature from 20° to 30°, making even the tongue and breath cold, would scarcely fail to be fatal, independently of the wasting discharges and other symptoms of cholera.

PATHOLOGICAL OBSERVATIONS.

If cholera were represented by no internal lesions discoverable *post mortem* by the anatomist, still its representation by symptoms and by external alterations before death explain, to a great extent, beyond peradventure, its character and its fatal march. Its lesions, functional and material, are even during life striking in an extraordinary degree, for their prominence and their universality, while the alterations of central organs as found after death are various, of uncertain seat and scarcely appreciable in some cases as being truly characteristic of the malady.

In cholera, death may obliterate lesions upon the surface, and, *à fortiori* in the centres. Icy coldness gives place to heat, venous collapse to venous turgidity, blueness to pallor or dusky flushing, and shrivelling to plumpness. Even the muscles which had been in repose before, or at death, may afterwards become agitated with contractions and twitchings for hours. The withered, shrunken body, limbs, fingers, etc., no longer in the grasp of the disease, augment in size or recover their volume. The viscous sweat gives place to a more natural condition of the skin. The putrefaction of the choleraïc body is slow. The intestines are generally free from offensive matters and gases.

There is often at the inception of cholera a slight chilliness, (of which the patient seldom complains) accompanied with yawning, and probably with congestion. The nasal passages after a time, become, in some cases, stuffed or obstructed, not by mucosity but from congestion of the mucous membrane as in incipient catarrh, which, without any marked secretion or excretion, disappears in a few hours or when the disease is arrested.

The suppression or rather the alteration of the salivary secretion is usual and early in cholera. The mouth if not dry, is moistened with a watery rather than a salivary liquid.

The physical and physiological law of exosmosis and endosmosis or its compensating normal equilibrium, appears to be changed in cholera, that is, exosmosis is greatly increased, endosmosis greatly diminished, as regards the alimentary canal at least.

It may not be possible to show how the specific cause of cholera acts in changing the normal affinities between septa and the fluids, between the serum of the blood and the mucous membranes, so as to give morbid or deranged exosmotic and endosmotic actions. Such actions doubtlessly exist. Cholera, if this view be correct, may be called an abnormal or *hyper-exosmosis* of the alimentary canal.

Independently of any evidence resulting from post mortem examination, cholera is from first to last attended with inequilibrium of the circulation, (virtually a congestion,) as is evident from the physical aspect of the disease. This, like some other morbid changes, as for instance shrinkage, coldness, is greater during life than soon afterward. Even if the general system and the individual organs should be found after death comparatively free from engorgements and unequal distributions of blood, this condition may have been brought about by the enormous discharges of serum from the blood during life, and by the post-mortem action of the capillaries of the periphery, whereby the central vessels have been relieved from congestion.

The tissues of the circumference, skin, arteries, veins and capillaries are not distended with blood, as in the healthy state, while central congestion, irritation, and exhalation or effusion consisting of the serosity of the blood, takes place into the digestive tube. This condition, increasing the disease, increases; abating, the disease abates.

This supposed congestive character of cholera would lead the pathologist to expect that the spleen, a spongy, vascular, distensible organ, would be found engorged with blood. This is not the condition of the spleen as found soon after death. Indeed, the contrary condition prevails to an extent not found perhaps in any other acute disease. The spleen is frequently pale, very supple, shrivelled, greatly diminished in size, (one-half in some cases,) and, comparatively, anæmic. The choleraïc discharges seem, therefore, in many cases, to reduce the spleen, in size, color, and brittleness. How this exosmotic anæmia of the spleen happens, remains to be discovered. Although this condition is far from being constant, yet it is probably peculiar to this malady.

All diseases are, of course, to a certain extent, similar or identical, otherwise they could not be referred to under the genera of diseases. The separation and classification proceed by identities, analogies, and differentiations.

Cholera resembles pernicious intermittents and congestive algid fever much more than yellow and typhus fevers, but at the same time presents well-marked differentiæ.

The living lesions upon the surface of the body in cholera, as already stated, are very striking and characteristic, and their possible diminution or obliteration after death, must not be forgotten by the pathological anatomist; color, temperature, skin, and the physical appearance of the cadaver are, in many instances, for a time, more natural than during the last stage of the disease.

The pathology of cholera may be in part explicable by referring it to a violent waste of nutrition, virtually an acute starvation throughout the entire economy. Here the whole circle of the dynamical nutritive actions are not only suddenly arrested, but absolutely inverted, virtually starved by rapid wastage and decomposition among the nutritive elements of both liquids and solids.

In health, waste and repair are, physiologically, *in equilibrio*, that is, the morphological and reparative processes sustain a definite relation to each other. In cholera, there is not only an interruption to, but a sudden extinction of nutrition, decomposition replaces and overpowers composition—carbon, oxygen—waste, repair—retrogression, progression—pathology, physiology—death, life.

The pathology of cholera admits of illustration, by viewing it as a virtual hæmorrhage or effusion of the colorless portion of the blood. Experimental investigators have proved that the choleraïc liquid is virtually identical with the serosity of the blood, from which latter it is parted by the cholera-producing poison, and with a rapidity too, seldom witnessed in hæmorrhages proper, from the lungs, bowels, stomach, kidneys, uterus, etc.

The chemical, dynamical and vital properties of the blood, thus deprived of its serosity, are greatly changed, and their relative proportions and chemical combinations altered. The blood becomes viscous, dense, dark, poisoned, carbonized, and its circulation in the capillaries diminished or arrested.

Cholera viewed in the light of a dynamic or spasmodic disease, is nearly allied to convulsion, or even to tetanus, which is supposed to affect the nervous system chiefly. It certainly affects the muscular system. Repeated spasms are not only extremely painful, but they tend, upon mechanical principles, to obstruct the circulation in some parts of the system, while they rapidly exhaust the vital and muscular energies.

Nearly three months before the second great invasion of cholera, I made the following note in MS. vol. XIX: Cramps (now Sept. 26th, 1848,) appear to be very common, both idiopathically, and symptomatically in fevers.

The following case of cramps was one of great severity, and came nigh a fatal termination: 1848, Sept. 25th. C. M., Irish laborer; aged 35; resident five years; was seized with violent cramps in his limbs, extending to his fingers, etc., towards the close of the day, while carrying sacks of salt on the levee. His comrade was similarly but more slightly affected. M. walked home at 6, P. M., a distance of three miles, suffering much; was pale, vomited, and had a second defecation for the day. In two hours after, I saw him, the cramps were almost constant, though the paroxysms were greatly augmented at intervals, like explosions. Five or six persons rubbed him; others applied clothes dipped in hot water to his limbs and body, which he said afforded temporary relief; his pulse was irregular, rapid, small, feeble; respiration laborious and unequal. His skin pale, bathed in profuse perspirations, was bloodless, wrinkled, and excessively shrunken. His screams were terrifying; senses natural. Morph. sulph. gr. ij; quin. sulph. gr. x; in two ounces syrup; one-third given at once. This dose soon arrested the cramps for some hours; another third he took in the night.

September 26th. Used the remaining third of the syrup; also baths. He had slight cramps; eyes red, injected and almost ecchymosed; skin filled up with blood; was somewhat hot; nausea and vomiting.

There can be little doubt that in a few hours the cramps would have proved fatal, if they had not been arrested. (Another patient, two days sick, affected with remittent, suffered during the same night at

Gretna, with cramps which caused him to get up, walk, and remain out of bed nearly all night.)

27th. He is convalescent.

In the following case, copied from the same MS. vol., the spasms appeared to have been the immediate cause of death: May 31, 1849; Called, 1, P. M., on board of the British ship, Woodstock, two weeks in port, to see J. an English seaman, aged 35, who had continued to work until 9, A. M., though he had had diarrhœa for six or seven hours before cramps and vomiting took place. Pulse small, variable, generally quick; skin cool, moist; face dusky; hands wrinkled, shrunken; eyes sunken and inclosed in dark circles; thirst; tongue clean; cramps almost universal, being severest in the legs at first, then in the thighs, appearing to reach to the diaphragm, chest, and belly; had a fluid stool soon after my arrival.

I gave an enema of laudanum, undiluted, about ℥ss, after which he had no more stools, nor had he any narcotism; five or six tablespoonsfull of mustard given in rapid succession; vomited only twice, after which cal., quin., and camphor were given every fifteen minutes until four large doses were given; they appeared to produce no effect; were not vomited. In two hours five doses of spt. lav., brandy, quinine, tinc. opii were given, and repeated but without any apparent result.

As the cramps were severe, universal, and almost incessant, and, as all the ships' company and bystanders were in favor of friction, including the patient himself, it was determined to give this a fair trial. Six sailors rubbed him with but slight intermissions until he died. The rubbing was of the most powerful kind over the whole body, but the patient demanded it more and more. For two hours a liniment of ol. terebin., mustard, red pepper, and vol. alcali was rubbed in abundance; the skin became red, yet the pulse grew worse, the skin and tongue colder, and the cramps increased. Blankets next were wrung out of hot water and applied every five minutes; but the tongue became almost icy-cold; the pulse failed; asphyxia increased.

The mind, in the meantime, remained clear. Neither the opiates nor the stimulants produced their characteristic effects.. Hence, it may be inferred that they were not absorbed.

The violent frictions were continued at his request as they gave him some relief. The collapse, in the meanwhile, increasing until 7, P. M., when, six hours from the supposed commencement of his disease, death closed the scene of suffering from cramps and spasms, the severity of which language cannot describe.

Here death seemed to result, not from the discharges, which were slight, but from the violent spasms of the entire muscular system, limbs, trunk, centre, circumference. Probably the diaphragm and heart, as well as the abdominal muscles, were affected with these tetanic convulsions.

(*To be continued.*)

ART. IV.—*Sudden suppression of the Menses.* From the case-book of the late Dr. A. HESTER.

MADAM * * *; married, but no children; aged about 38 or 40 years, was seized January 9th, about 10, A. M., with sudden suppression of her courses, without any assignable cause. Found her with legs flexed, complaining of violent spasmodic pains around the umbilicus, attended with total suppression; constipation; frequent, but ineffectual efforts to make water, attended with bearing down pains, nausea and vomiting; pulse regular, soft, and numbering about 70; tongue nearly natural; but little thirst; skin not hot; described the pain as radiating from umbilicus to *scrobiculus cordis*, and to *pubis;* could not bear the slightest pressure over any part of the abdomen, which was slightly distended. Had taken rice water, but threw it up. Ordered hot fomentation to abdomen, warm hip-bath, an enema of cast. oil.

Evening, 5 o'clock; some relief from fomentation and hip bath, enema did not operate; still tender over abdomen, so much so, as to shrink on the slightest touch; pulse about 80, and soft, no tension. Ordered forty good leeches to hypogast. and around umbilical region, to be followed by hot emoll. cataplasm to encourage the flow of blood; and take this pill: ℞. Calomel, gr. x: ext. rhei, gr. vij; *m.*; pills, no. IV.

January 10th. 8, A. M. Leeches produced slight relief; poultices were not continued long enough; pains returned about 12, M., took a dose of laudanum; repeated hip-bath. Find tongue rather red at tip and on edges; there is slight cephalalgia; took oil this morning and vomited it up; pulse rather quick, about 85, but soft; nausea; bad taste in mouth; no operation; slight show of the courses. Still great tenderness and hardness over epigast. and abdomen generally; less pain in urinating. This lady is subject to severe attacks of *bilious colic*, from time to time. Ordered sulph. morph. gr. j; carb. sodæ ʒi; aquæ menth. f℥iv; aquæ font. f℥iij; M. Tablespoonful to allay nausea and check vomiting, which cause so much distress by the contraction of abdominal muscles. Hot emoll. cataplasms to abdomen. Enema of infus. sennæ and sulph. magnes.; toastwater.

Evening. No better; nausea and occasional vomiting; dysury; thirst; tongue rather red at point; pulse about 90, and rather hard, and wiry; skin moist; general hardness and tenderness of abdomen; lies with legs drawn up; great tenderness over the spine in the lumbar and sacral regions; no operation from bowels; no signs of menstrual flow, since this morning. Took the morphine mixt. but once or twice; applied the cataplasms. Ordered this evening; v. s. *ad* f℥x vel xii; *cucurb. cruent. ad regi. sacr. et lumb. ad* f℥x *vel* xii; and to take calomel gr. xv; comp. ext. colocynth. gr. v; F. pills no. IV; one every two hours; at 3, A. M., if no operation, enema of flax-seed tea; continued cataplasm to abdomen; warm, dry applications to feet.

January 11th. Blood was drawn, and was soon followed by a large evacuation from the bowels; then the cups were applied. Considerable relief ensued; the pills were given as directed, but no evacuation produced after the one already mentioned. About day-light this morning, the pains were renewed, and finally centered upon the uterus and bladder, causing bearing down pains, efforts to urinate, cramps in the thighs, and pains across the loins. Thirst; small, frequent, and rapid pulse; skin warm and moist; countenance pale and indicative of great suffering; still tender over abdomen. Ordered constant *hot fomentations* to hypogastric region; an enema of 100 drops tinct. opii, in solution of starch; continue morph. mixt. and soda. Left directions that if these means did not produce relief at the end of one hour, leeches were to be applied, if possible, to the *os tincæ* or to the *labiæ*, and the hæmorrhage encouraged until relief was obtained.

Returned at 1, P. M., and found that leeches had not been applied, as relief was obtained from the application ordered, soon after I left the house. Ordered them continued.

Evening, 6, P. M. Much better; abdomen soft and much less tender; no bearing down pains; can extend legs; skin warm and moist; pulse soft, rather quick, but not so frequent; less thirst; also less head-ache. Ordered same means continued, and left this prescription to be given if pains should return: ℞. Gum camph. ʒss; sulph. morph., gr. j; mucilage g. Arabic, f℥vj; syr. simp., f℥ss; M. Table spoonful, repeated every 3 or 4 hours. Enema of flaxseed tea, if required.

January 12th. Scarcely any material change since last account; pulse and skin as above mentioned; some headache to-day. Ordered same treatment.

January 13th. Still better; no pains; but some soreness of abdomen generally; no menstrual discharge. Skin and pulse good; bowels moved two or three times, with relief. Ordered medicine to be gradually reduced and light nourishment.

January 14th. Patient cured; the courses having returned.

ART. V.—*Meningeal Tumors, with Sundry Complications:* By BENNET DOWLER, M. D.

CASE I.—1833, December 29th. Called to see Aaron, aged 27, negro slave of Judge D., at Clarksburg, Virginia. Received the following history: A. was confined to his bed three months ago, with what was supposed to be fever (typhoid?); took several cathartics of calomel, rhubarb, and aloes; was afterwards treated by steam doctors (Thompsonians). He recovered in some degree; attempted to work a little; but continued to complain, and soon returned to his bed again.

Pulse slow and corded; cough; wheezing; much expectoration; tongue furred; constipated; urine scanty and loaded with epitheliaal scales; skin rough, hard, scurfy, dry; extremities cool; left leg anasarcous, and much enlarged, as far as the knee; the epidermis of which is exfoliating; has sharp intermitting pains in this leg; no other indications of dropsy excepting in the left limb aforesaid.

The scaly, thickening, dryness and insensibility of the skin of the chest appeared wholly to prevent the action of a blister which had been applied. Debility; confined to bed; his appearance either idiotic, or as if stunned by a blow; comprehends questions with great difficulty or scarcely at all, unless repeated frequently and loudly; speaks in a drawling, imperfect manner, at the same time violently contracting his eyebrows; forgets the connection of his discourse, but does not substitute incoherent words; almost deaf; sometimes delirious, particularly at night; has appetite; is thirsty.

Learn that six years ago, Aaron had a severe fall from a horse, thereby hurting his head, which confined him to bed for several days. He was considered a stupid negro by his owners.

It is not necessary to give the details of his daily symptoms and treatment for the next twenty-five days' attendance: bandages to the leg;

diuretics; cathartics; enemata; expectorants; nitro-muriatic spongings over the body, aud other remedial measures were resorted to, with apparent advantage for a time. In a week or ten days the anasarca disappeared from the leg; the tongue became clean, and at a later period, the urinary discharge become more copious; the skin natural; the mucous rattles, wheezing, cough, and sputa diminished. His circulation and temperature were, however, variously affected; sometimes the skin was hot; the pulse hard, irregular, intermittent, yet slow; he was restless; complained of headache; yet the light was not painful; the pupils were contractile and responsive to light during almost the whole course of the disease. In the meantime his intelligence was slightly improving until near the close of life.

On several occasions Dover's powders were given at night, with a view of procuring rest and diaphoresis; but their effects appeared injurious by producing a comatose, unnatural sleep; the temporal, frontal and the other veins of the head became distended as if varicose.

Finally he had fever; great thirst; uausea; vomitings; increased torpor of the bowels; had a weak, small, intermittent, yet slow pnlse; copious urinary discharges; coldness of the extremities; noisy respiration; mncous rattles; growing somnolency; universal prostration; prolonged and finally deep coma.

Two curious, though apparently trivial facts remain to be mentioned, namely, throughont my attendance, whenever an enema was prescribed, a formidable difficulty was always encountered from the spasmodic closure of the sphincter ani; again, as he generally past his urine and fæces in bed, he charged these nuisances most positively upon some of his fellow-servants or some of his acquaintances.

Aaron died January 23d, 1834.

Post mortem examination sixteen hours after death, assisted by one of my pupils:

Chest.—Bronchial mucons membrane engorged and loaded with muco-purulent matter; lungs free from tuberculization; portions of both were, however, very dense, heavy, and liver-like, in a word, complete specimens of red hepatization. Aörta uncommonly large, perhaps a partial dilatation.

Abdomen.—Both the small and large intestines were empty, vascular, and in many places contracted; the mucous tissues tnmefied, injected, and dark in patches. The stomach contracted, thickened, blackish, and softened, all the coats tearing upon, forcibly inflating the organ. The liver, spleen, kidneys, pancreas, etc., unaltered. The gall-bladder enormously distended, with about five ounces of liquid, like dark, thin

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molasses; the fat of both the greater and lesser omenta, had disappeared; arteries empty; veins engorged.

No dropsical effusions in the chest, bowels, or cellular tissue.

Head.—Ararchnoidal and ventricular serosity eight to ten ounces; pia mater highly vascular and engorged; brain firm, bnt in this respect scarcely morbid.

A tumor of a grayish color was found on the right side of the brain covered with the cerebral meninges, nearly opposite the npper part of the mastoid of the right temporal bone, between the auditorins internus and the great lateral sinus. The pedicle or neck of this tnmor upon the brain was about two or three lines in diameter; from this stalk it enlarged abruptly into a bilobed spheroidal body, which was imbedded in a blind hole in the petrous portoin of the temporal bone, the inner plate of the latter having disappeared doubtlessly from the pressure of the intruding meningeal tumor. This tumor weighed 120 grains, one lobe-like portion of which appeared as a somewhat broken down matter, softer than brain; the other and larger portion was somewhat hard, uneven, and fibroid, the whole constituting what might be called a *cerebro-meningeal tumor of a cancerous character.* It had formed no adhesions to the osseous cavity which it filled in petrous bone.

It may be remarked that the lesions found in the stomach and bowels, though severe, were probably consecutive and late in their development; the appetite and digestion having been but little impaired until the last week of life, when nausea, vomiting, and increased febrile action took place. The lesion of the stomach and the cerebral effusion were probably the immediate causes of death. Hepatization and bronchitis were snpposed to have been of several months' duration; bnt doubtlessly tended to complicate the case and augment its danger.

The anasarca and pain of the leg occurred on the side opposite to the one affected with the tuberiform mass. It is remarkable that the usual phenomenon of cerebral lesion, paralysis on the side opposite the lesion did not occnr; but, instead of this, there was anasarca of limited extent, which, however, had disappeared nearly two weeks before death.

The intercranial serosity which was limpid, was found chiefly exterior to the brain, in the ararchnoidal sack. The cerebral snbstance and meninges were alike free from serons infiltration.

There was neither paralysis of motion, nor sensation, nor convnlsion. Nor was there any tetanic spasm, excepting the rigidity of the anal muscles. Intelligence was not wholly abolished until near death. Delirium was infrequent, notwithstanding the hallucination in reference to the nuisance committed in bed as already stated.

Case II.—Sept. 16th, 1853; 9, a. m.; deadhouse 88°. *Yellow Fever.*

C. W.; born in Germany, aged 25; resident three weeks; last from Memphis; a baker; admitted yesterday, sick one day. Learn that during the time he was in the hospital, thirty-six hours, he took no medicine, but arrow-root; diluent drinks; was sinapised on the abdomen; had neither vomiting nor diarrhœa; was sometimes delirious, and, finally, had to be tied in bed to prevent him from getting up and wandering about.

Died in two and a half days' illness.

Autopsy.—Neck limber, limbs rigid; skin yellow and in dependent parts nearly black with cadaveric injection; body of medium size; muscles well developed, natural in consistence and color; adipose tissues moderately developed; blood liquid and dark. A very remarkable anatomical fact was noticed in this man, namely, a supplemental bone running upward, backward, and outward from the hyoid bone and thyroid cartilage to the styloid process, being slightly cartilaginous at its upper extremity. Lymphatic glands somewhat hypertrophied in the trunk, neck, and limbs, as well as the mesenteric glands.

The papillæ of the base of the tongue enlarged, dark red; the latter color prevailed in the mucous membranes of the pharynx, larynx, trachea, and bronchi; the lungs much engorged and dark. The heart contained dark, diffluent blood on the right side; the subserous tissue of the right auricle, the tricuspid, and the chordæ tendinæ of both sides, dark red, injected and somewhat thickened or tumefied.

Omentæ emaciated, vascular, injected, red, portions black like gangrene, but without loss of cohesion. The liver, a little enlarged, natural in consistence, inclined to a straw-color. The gall-bladder contained about half an ounce of thin, darkish liquid, leaving a yellow tinge on white surfaces. The spleen hepatized and hypertrophied about six times; kidneys engorged; bladder contracted and empty; pancreas, solar plexus, and ganglia, natural.

The jejunum and ileum, each had a firm intus-susception from above downward, the invagination extending from three to four inches. The cardiac half of the stomach was internally of a deep claret color, the mucous tissue thickened; the sub-mucous had punctiform rather than arborescent injection; a considerable portion of both the large and small intestines had a similar appearance, particularly the lower portion of the ileum, the entire cæcum, and the lower portion of the rectum. The stomach and jejunum contained much blood mixed with a grayish liquid like arrow-root. The large intestine and portions of the small, were contracted or collapsed; there was neither fæcal matter nor bile in them.

The brain somewhat vascular and injected, was of natural consistence; its pia mater vascular, with but little injection or turgidity; serosity about one ounce.

Upon the superior surface of the tentorium, and at its inner margin on the right side, adjoining the crura of the cerebellum, an atheromatous(?) tumor was found, composed of soft, granular, rounded aggregations of a pearly or spermaceti hue, easily separable from each other, many being as large as a small pea, but formed of smaller ones. These bodies, though agglomerated into a rounded mass, were not enclosed in a common cyst. This mass was less firm than scirrhous, fibroid or tuberculous tumors generally are. It was nigher the encephaloid or soft cancer in its consistence, but was non vascular. The microscope did not discover red blood-vessels in its structure. The granules appeared free from fibrous structure, their cohesion being slight or brittle, like a soft-boiled potato.

This tumor had no apparent connection with the brain. Its subordinate spheroidal granules appeared to be enveloped by indescribably thin laminations of the cerebral arachnoid, yet totally free from the latter as reflected upon the dura mater.

Capillary vessels could be seen approximating the tumor. The granules were apparently developed from the terminal branches of the subarachnoid capillaries as grapes from their stems.

The tumor weighed eighty grains. The arachnoid must be regarded as its seat.

The tumor was probably a chronic one, not having been developed during the brief illness which caused death; a conclusion strengthened by the remarkable fact that the adjacent portions of the brain and its meninges were free from injection, vascularity, redness, and all other appreciable alterations. The expectant treatment in this case cannot reasonably be supposed to have caused any of the lesions enumerated.

Judging from my own experience in pathological anatomy, which has been extensive, I regard the tumors above described as exceedingly rare, as compared to meningeal tuberculosis, cysts, etc.

As the first case copied from my second MS. volume is not very fully reported, I beg leave to supply this deficiency by adding a case from Scandinavian authorities, presenting a certain degree of parallelism as well as contrast to that of the negro Aaron. The case is taken from the July (1857) number of the *Dublin Hospital Gazette*, the reading of which recalled to mind the history which I have already given :

"*Transactions of the Swedish Society of Physicians. Session* 1854-55. *Case of Chronic affection of the Brain: By Hrr. Malmsten and Retzius.*—Lieutenant J., aged about 50 years, who had for many years suffered from obstinate constipation, in the commencement of 1854, got pain, and a sensation of weight in the head, gradually increasing until spring, when he was attacked with symptoms of violent cerebral inflammation. He was then attended by Dr. Klintberg, and got better. In the early part of summer he came to Stockholm, on account of his health, and then complained of obstinate constipation and severe headache. His articulation was slower than it had been in health, he had a staring look, and there was some weakness in the right extremities, causing the patient, in walking, to incline to the right. Attacks of severe cerebral congestion returned periodically, when there was extremely violent headache, more or less delirium, and very considerable contraction of the pupils. Such an attack usually terminated in five or six days, leaving the patient duller, and his speech more incoherent. Some organic disease of the head was suspected, but a difficulty was felt in defining its seat. The prognosis was unfavorable. The treatment consisted chiefly in the use of derivatives; iodide of potassium was not borne. The patient passed some weeks, during the latter part of the summer, at Bie, where a similar violent attack occurred; he subsequently returned to Stockholm, his disease becoming gradually more fully developed. During the last three months the torpor, incoherence of speech, and vacancy of expression of countenance increased, but no complete paralysis set in. The constipation was so obstinate, that no aperients had any effect. Spasms in the right arm and leg finally came on, and death supervened, after the patient had lain for some days in a comatose condition. On opening the cranium the convolutions of the brain were found to be flattened, and the blood-vessels highly congested. On the summit of the right hemisphere was a tumor one and a half inches long and one inch broad, elevating itself about a line and a half above the normal softer brain. The ventricles were all filled, and somewhat distended with serous fluid. Hr. Malmsten added several observations upon the seat of the disease, and the symptoms during life; after which Hr. A. Retzius, to whom the examination of the brain had been intrusted, made the following report:

"In the region over the fissure of Sylvius, on the right side, the arachnoid and pia mater were thickened; the latter presented a considerable increase of vascularity. Within this was found a hard portion which, when it was examined, was ascertained to be a mass in part reddish-grey, and in part whitish-yellow, extending to a thickness of from three to five lines within the hemisphere, through what has been called the roof or lid of the fissure of Sylvius. From this the diseased mass extended to the remarkable cerebral ganglion, which Burdach has called the white part surrounding the lenticular nucleus (*corpora striata externa* of authors). On the surface of the ganglion a condition of softening existed, reaching, however, only a few lines inwards, with an extent of a little more than half a square inch. Hr. R. believed that the phenomena which had been most prominent during the patient's illness, proceeded from pressure and softening in this situation. On microscopic examination of the diseased mass, he had found that it consisted chiefly of fibrous elements, most abundant about the centre of the mass; and towards the surface more and more mixed with corrugated, and as it were hardened nuclei, somewhat larger than blood corpuscles, and rather yellowish in color. In many places these lay crowded in small knots, as if they had been enclosed in cells whose walls were destroyed. A smaller number of so-called corpora amylacea, likewise corrugated and yellowish, also occurred here, with remnants of cerebral tubes, and cerebral cells of various sizes. This morbid mass had no defined boundary, no investing membrane, but was formed by a local deposition of fibrinous plasma from the blood-vessels passing into a state of induration. In some of the neighboring portion of the brain a more recent acute inflammation of small extent had set in, causing softening and death.—p. 32."

ART. VI.—*Remarks on Medical and General Education:* BY BENNET DOWLER, M. D.

THE last act and the last scene of the college drama, the diploma inauguration, is an event of great import to the medical student. He is then made a doctor in pedantic Latin, and hopes like Butler's Prince of Syracuse, to

> "Find his *subjects* ne'er were so obedient
> As when he was inaugurated pedant."

Except in China, *O eruditissime Domine,* your diploma, though well merited, will not always command the respect of the public, much less that of the Government of this great Republic. In the Celestial Empire it is far different, thanks to the Manchow dynasty of Ta-tsing, as will more fully appear in the sequel.

Wood, the historian of Oxford, relates, that "two students having one day presented themselves at a baronial castle, and sought an introduction by the exhibition of their academical credentials, (diplomas) in which they were each described as gifted, among other accomplishments, with a poetical vein, were ordered by the baron to be suspended in a pair of buckets over a draw-well, and dipped alternately into the water, until each should produce a couplet on his awkward situation; it was not till after a considerable number of duckings, that the unfortunate captives finished the rhymes, while their involuntary ascents and descents, during the process of concoction, were heartily enjoyed by the baron and the company."—(Craik, *Hist. Lit.*, ii, 148.)

There is reason to fear, at the present day, that, if all who get the degrees of A.B., A.M., LL.D., D.D., M.D., were required to give proof of the ability and learning set forth in their Latin parchments, some might be in as sad a dilemma as were the Oxford students.

If the diploma crop should go on increasing, as the interest of institutions who derive a revenue from such increase requires, the supply may finally exceed the demand, and become as valueless as the title of captain, esquire, or one of the sovereign people! Hence the importance of endowing institutions, so as to make them independent of the patronage of the pupils who may be candidates for diplomas: otherwise these institutions have an interest in lowering the standard of education.

The depreciation of diplomas and other literary distinctions, scientific honors, testimonials, and encouragements is an evil, the disastrous effects of which it would be difficult to over-estimate in its effects upon the progress of useful knowledge, discovery, and æsthetics, the animadversions of the satirists and self-sufficient utilitarians to the contrary notwithstanding.

R. M. Martin, Esq., (Colonial Treasurer,) in his work on China, (2 vols., Lond., 1847,) says, that "learning is indispensable to attain an office of trust in that country. Every peasant and the poorest fisherman can read and write. The average number of students at Canton alone exceeds 8,000. Out of so many candidates only 71 can obtain the second degree, *Keu–jin;* the third degree, *Tsin–sze*, is conferred only at Pekin."

Mr. Martin, whose official duties led him to visit all the accessible districts of China, maintains, from observation, that the examinations of candidates for degrees, in that country, are far more strict and impartial than in Christendom. He says: "It is on the literary institutions of China, the government chiefly relies for stability and support. The military are not adequate to the task; and hence the great attention and uniformity of their system of education throughout the whole of the celestial dominions. Wealth and station have their influence here as well as elsewhere, but learning is indispensable to attain an office of trust, and this is the policy of the state, by opening a way to the ambitious, that they may attain to the highest office in the government, and thus prevent the overthrow of the ruling powers. The governors and all the officers under the crown have distinguished themselves by their intellectual powers."—(i. 75.)

These quotations are given, not to show that the sciences are more advanced in China than elsewhere, but to show that the Chinese principle is a good one in all governments, namely, that all the high and important offices should be intrusted to the learned and wise alone, and not to the ignorant and incompetent.

In this Republic, neither learning nor literary distinction appears to constitute any claim to popular suffrage or political preferment. From the humblest corporation to the national government, the claims to legislative, executive, and diplomatic office, founded upon scientific and literary attainments, are not simply ignored, but really seem to stand in the way of promotion, at the present day.

It may perhaps be said, that on the whole, modern education is deficient as compared to the past, in reference to the classics of antiquity. Nevertheless, the advantage is with the moderns in regard to the positive sciences, useful improvements and discovery. The men of learning of the present day, and the men of learning of the fourteenth, fifteenth and sixteenth centuries, afford, in many respects, a contrast.

Instruction, in the positive or the experimental sciences, is now essential to the prosperity, usefulness, and permanence of all educational institutions worthy of the name.

"In the reign of Edward III, (1344,)" says Hume in his History of England, "there were in the University of Oxford alone thirty thousand students. What was the occupation of all these young men? To learn very bad Latin and still worse logic."—(ii. 472.)

It is to the earlier rather than to the latter days of this Republic, that one must look for philosophers as well as patriots in the legislative and executive departments of the government. Sciolists of the modern political school, (the greatest-number-of-votes-school,) assume that men of education are not qualified to serve the people, and the same error has been sometimes advanced by physicians in relation to medical practice. The natural history of calves shows ingratitude of a similar character, since these foolish creatures butt the teats from which they get their nourishment.

Whence the decadency of this old and celebrated institution? Let one educated in it answer. Of this university, Sir C. Lyell says, that "from 1840 to 1844, chemistry and botany attracted only from three to seven students; geometry, astronomy and experimental philosophy scarcely more than chemistry and botany—mineralogy and geology ten to twelve students. The classes of some of the professors were entirely deserted. Cambridge has passed through the same phases as Oxford."—(Travels in North America. 1845. ii, 212 *et seq.*)

Sir Charles, however, accounts for the decadency of the English universities by alleging the incompetency of their teachers: "The choice of teachers is not open to free competition, a few tutors only are selected from merit." He also attributes this decline in part to the prevalent "utilitarian spirit. Even on purely utilitarian grounds, nothing can be more short-sighted than the usual policy of the herd of *cui bono* philosophers, who award higher honors and emolnments to the application than to the discovery of scientific principles."

The antithesis which sciolists pretend to discover between speculative and practical philosophy is altogether invalid and visionary.

Professor Liebig in his letter to Professor Faraday, dated a few years ago, says: "What strnck me most in England was the perception that only those works that have a practical tendency awake attention, and command respect, while the purely scientific, which possess far greater merit, are almost unknown. And yet the latter are the proper and true source from which the others flow. Practice alone can never lead to the discovery of a truth or a principle. In Germany it is qnite contrary. Here, in the eyes of scientific men, no value, or at least but a trifling one, is placed on the practical results. The enrichment of science is alone considered worthy of attention. I do not mean to say that this is better; for both nations the *golden medium* wonld certainly be a real good fortune."

The surest way to effect educational reform, to prevent decline, and eradicate sciolism in science, and to elevate the scientific character and claims of stndents and colleges, is to appoint none but able, learned, practical and conscientious professors, instead of acquiescing in the system of self-appointment and self-perpetuation. A manual and a methodical plan for the examination of *teachers*, are, as yet, desiderata to such as are sincere in their wishes for the real and certain progress of medical edncation.

In a paper relating to medical education in the *Med. Chir. Review* for October, 1848, the writer maintains that "*a superior professional education cannot be given without superior teachers.*" Distrusting the propriety of the chemical course, he thinks that "chemical physiology ought to be taught in the physiological course, pharmacy in that of materia medica, pathology and therapeutics in that of practice, botany and chemistry being of little practical value except as branches of general education."

"A peculiar featnre of the Medical School of Paris is the *Concours*. All medical appointments from the lowest to the highest are determined by this test. A series of subjects is selected by the faculty, on which the competitors are obliged to treat both in writing and orally; these are determined by lot; each lesson is delivered in public and before the faculty and it must occupy one hour. Each candidate must, moreover, write a thesis on a subject selected by the jndges, and defend it publicly against his opponents. The *concours*, which is a severe trial, possesses one great advantage—it is a *test*, and if not altogether perfect, it is infinitely superior to the system pursued in England, where preferment too often goes by favor, and the ignorance of the aspirant is only discovered when it is too late to apply the remedy. By the *concours*, a man, however lowly his origin and however humble his worldly advantages are in other respects, may yet rise to the summit of his profession by indnstry and talent alone, a fact which is strikingly illustrated by the conrse of most of the leading members of the profession in this country. Medical students who propose to graduate must have studied four years, must have obtained a diploma of Bachelor of Arts, and must undergo five examinations, write a thesis, etc."—(Galignani's *Guide to Paris.*)

As late as two centuries ago, the men of letters, lawyers, doctors, divines, and others wrote books, corresponded, disputed, and lectured in Latin, but as critics admit, in Latin unworthy of Cicero or Celsus. The progress of the positive sciences and the advanced state of knowledge since that period cannot be acquired and applied according to the exacting demands of the nineteenth centnry, at least by a majority of students, without, in some degree, neglecting the ancient langnages. What the veteran philosopher, Hnmboldt, says in his Cosmos concerning man in general, applies particularly to the physician, namely, "man can prodnce no effect upon natnre, can appropriate none of her powers, if he be not conversant with her laws, with general relations according to measure and number."

Bnt how shall the physician best acquire a knowledge of the laws of nature in special reference to the art of healing? Neither the learned langnages nor the science of mathematics is sufficient for his practical pnrposes, and if much time be spent in these studies so as to make him thoroughly master of them, the probability is, that "the weightier matters of the law" will have been neglected. Of mathematics, Goldsmith, himself a graduate in medicine, says: "Mathematics are perhaps too much studied at our universities. This seems a science to which the meanest intellects are equal. I forget who it is who says that all men might understand mathematics if they would." — (*Inq. into Polite Learning.*)

The late Dr. Abercrombie, in his interesting work on the *Intellectual Powers*, says that "the chief error in education is the devoting too much time and attention, in females, to superficial accomplishments, and in males, to mere acquirement in languages and mathematics. The great objects are things of real utility—habits of observation, association, and induction." In a word, the student must devote himself to the facts and principles of the experimental as well as the mathematical sciences.

Dr. Whewell very justly says that "it is a test of true theories not only to account for, but to predict phenomena. The idea and the facts must be *homogeneous;* and the rule must be *tested by the facts.* The method of natural classification consists in classing cases, not according to any assumed definition, but according to the connection of the facts themselves, so as to make them the means of asserting general truths." (*Induct. Sci.*, I, xxxix, xliii, xlvi.)

The French government has, like that of China, respected, consulted, and honored its learned men, with this difference, that the luminosity of French science is to that of China as sunshine to moonlight. It appears that in France the Academies forming the Institute chiefly, numbering more than two hundred members, compose a corps of scientific men who hold a semi-official relation to the government. The Institute of France consists of several Academies, the members of which receive about 1,500 francs each. Among these organizations are the Académie Française, 40 members (whose duties lead them to the dictionary of the language, including its purification and extension, the award of prizes, etc.); the Academy of Sciences, 65 members; the Academy of *Belles Lettres*, etc., (learned languages, antiquities, etc.) 40; the Academy of Fine Arts, (painting, sculpture, architecture, engraving, music,) 41; Academy of Moral and Political Sciences, (legislation, jurisprudence, political economy, statistics); the Academy of Medicine, 139 resident members. The Faculty of Medicine has 26 professors who receive from 2,000 to 10,000 francs; the Agrégés 2,000 to 8,000 francs.

The minister of public instruction is ex-officio president of the University of Paris, while many colleges, schools, and institutions sustain similar relations to the state.

Now whether this is a perfectly accurate enumeration in all of its details or not, is unimportant to the end for which it is given at present, namely, to suggest the fundamental principle that a good government, particularly a popular one, has constant need of such a body of independent, scientific men, for advisory purposes in numerous instances concerning the public good—instances in which neither a majority of votes, nor the qualification of most politicians can be trusted with safety. The expenditure of the public treasure in this behalf, would doubtlessly more than repay the reddest, the most ultra republicans.

Neither the houses of Congress, nor the executive departments can be too well informed in geology, mineralogy, metallurgy, meteorology, chemistry, agriculture, geography, astronomy, architecture, mechanics, political economy, jurisprudence, natural history, botany, zoölogy, hospitals, forensic medicine, hygiene, and other branches of science, art, and public economy, which exalt and adorn, while they contribute directly to the physical comforts and well-being of a nation. The kite by which Franklin discovered the identity of electricity and lightning, virtually enabled him to disarm the thunderbolts of heaven.

The army of the East, under Napoleon, in 1798, was as well supplied with philosophers, naturalists and artists, as with generals, Geoffroy, St. Hilaire, Monge, Denon, Berthollet, Fourier, (secretary to the Institute of Egypt,) and others, including learned medical men, who contributed to that great work, *Description de l'Égypte*, which formed an æra in modern research into Eastern science, art, history, arachæology, climate, diseases, etc. M. Contelle records the meteorology of Cairo for three years, 1799—1801; M. Regnault analyzes the Nilotic alluvium; M. Andréossy examines the structure of its valley; M. Nouet, astronomer of the commission of sciences and arts, surveys the heavens while conflagration sweeps over the land of the Pharaohs lighting up the summits of the pyramids; M. Villoteau writes more than 400 folio pages on the state of music in Egypt (*De l'état actuel de l'Art Musical en Égypte*) amid the roll of fire-arms and the reverberations of artillery.

Impartial history will show that these scientific commissioners, with few exceptions, proved themselves to be among the first statesmen in Europe, as Monge, Denon, Berthollet, Fourier, etc.

The government of the country as well as of the medical and other colleges, should be confided to men of education. Should reason become popular and common sense supreme, the people will intrust the legislative, executive, and judicial departments of the government to none but men of the highest moral excellence and of the greatest knowledge, whose intellectual superiority is the surest guarantee that they are practical men, who best know how to promote the well-being of society.

The British government rarely recognizes discoveries or eminence in the arts and sciences, and when it awards an honorary distinction, the latter is the lowest kind of knighthood. "Knighthood in England is now conferred by the crown by simple verbal declaration, attended with a slight form, without any patent or other written instrument. 'Sir' is prefixed to the baptismal name." The third and lowest class of knights, styled companions of the order, take precedence over esquires. It is believed that this latter distinction, small as it is, is the highest which has been conferred by the British government as a reward for scientific attainments and discoveries, and even this honor is very rare except in the army or navy. This is thought honor enough for the Isaac Newtons, the Humphry Davys, the Herschels, and too good for the Shakespeares, the Miltons, the Johnsons, etc., names more illustrious than any crowned head or peer of the realm.

The British and Foreign Med. Chir. Rev. for July, 1857, in its review of the reports on the Crimean army and its medical staff, holds the following language: "The honorary distinctions and rewards: the non-participation by the medical officers in the distribution of honors for service in the field, has long been a source of just complaint in the department. It is only within a few years that they were conferred on them with a very sparing hand, compared with their more fortunate brother officers. Nor has this been compensated for by the grant of the civil Order of the Bath, which for many of their services would be an appropriate reward, and though not conferred, has been often merited."

The American Medical Association has been, from year to year, exerting its influence with the Navy Department of the United States, in order to obtain for the medical officers in the naval service, the assimilated military rank or grade which is unjustly held from them, because they have not an actual command! The action of the government of late, had been directed to the positive degradation of these medical officers from their former rank!

The July (1857) number of the above named Journal concludes with an article on education, from which the following condensed extracts are taken :

"Fact is indeed stranger than fiction. What many of us have yearned for, but what none could have expected to see realized, is come to pass: Oxford and Cambridge have spontaneously offered to become the patrons and promoters of education of the middle classes, undertaking the task of guiding and testing the instruction given in the schools, by appointing and sending examiners to any place required, etc., etc., to grant certificates as to the qualification of teachers, to examine and certify concerning the elementary education of students, to confer upon the latter distinctions, honors, and the degree of Associate in Arts, etc.

"That the country will be glad to avail itself of a test such as the one proposed, can scarcely be doubted. There may be sluggards and dullards who would rather lag behind, or avoid entering into a new and an unknown course; but the *vis à tergo* will be too powerful for them, and the current once having set in, will sweep along with it all recusants. The desire of the public for an independent standard has been manifested on various occasions. One of the best known schemes of examination of an analogous character is that commenced already by the Society of Arts; and the best evidence of the value in which it is held, is afforded by the number of persons who subject themselves to the ordeal, and the interest taken by their friends in the success or failure of the denizens of distant towns and counties, as recorded in the daily papers. But important and demonstrative as these individual instances of spontaneous action may be, they will fail of the universal influence that must be acquired, unless a general organization is secured. The importance of the certificate to be obtained will be a sufficient security that the examinees will not be wanting. The security that the examiners will do their duty, will lie in their independent position—independent as far as petty and local or nepotic influences are concerned, dependent only upon the controlling influence of enlightened public opinion. The medical profession cannot, we are assured, but hail the prospects of a high standard of testing preliminary education—the education that must precede professional studies, if those studies are to bring fruit commensurate with their importance. Our medical corporations have striven nobly to secure this preliminary education in all their candidates, but it is manifestly not the proper sphere of a licensing body to do more than to ascertain the fact that the candidates have gone through a suitable curriculum. It will therefore necessarily be their interest to promote such a scheme as the one proposed, by requiring all their candidates not possessed of a University degree, to pass the examination before the Oxford or Cambridge Board. We would suggest that they at once put themselves in communication with the board, as soon as constituted, so as to arrange about the character of the examination which they would wish to regard as a minimum qualification."

Although the United States has, perhaps, more Universities (taking the legislative acts and charters for a guide) than insular and continental Europe, yet, probably, there is no one of them in the Republic, from which a Board of Examiners could now emanate, clothed with authority or sufficient influence throughout the different States, to accomplish the ends contemplated above, without the aid of the general and State governments, including existing institutions, the American Medical Association, the American Association for the advancement of science, and other similar organizations. In this way the so-called "self-made men," the artists, scholars, medical and other students, whose restricted pecuniary means never permitted them to enter colleges or universities, may have their competency tested, and be graduated without serious expense. Some of this class possess superior, yet unrecognized attainments in the arts and sciences. It is of no importance to the public requiring their services, whether their knowledge was acquired in a log-cabin or in a chartered college.

PROGRESS OF MEDICINE.

Art. I.—*Epidemic of Variola arrested in its progress by general Vaccinations and Re-vaccinations.* Translated from the *Journal de Médecine* de Bordeaux, of May, 1857, for the New Orleans Medical and Surgical Journal : By J. P. Barbot, Apothecary, New Orleans.

[Extract from a memoir to which the Imperial Academy of Medicine of Paris awarded a gold medal at its public sitting of December 16, 1856]: By M. Henry Gintrac, Adjunct Professor of *Clinique Interne*, Physician for Epidemics (*Médecin des Épidémies*).

Epidemics should occupy an important place in medical literature. They embrace the most important questions of social hygiene; they furnish to the physician great instruction, and are to him a source of investigation from which he draws materials calculated to elucidate certain pathogenetic and prophylactic problems.

Among epidemics, some are essentially aggressive and irresistible in their course; they strike cruelly and sometimes cause death, regardless of the most ingenious theories and the most rational systems of treatment, while others, less violent and more limited in their course, yield to a well regulated hygiene; the latter accord to medication a more evident salutary and preservative influence. To the latter category belongs the epidemic of which I will now treat.

For some years past, variola has been raging with some persistence in the department of Gironde; it seemed to have a predilection for this department, and on several occasions it assumed in some parts of it a truly epidemic form.

In 1854, the *commune* of Gujan, Canton de la Testo, was the seat of a serious epidemic of variola. I was sent by the prefect of la Gironde to that locality to study the nature of the disease, seek out the treatment best adapted to combat it, or at any rate, to point out the most proper method to check its progress. This epidemic having been made by me the subject of a particular study, I purpose to relate its principal manifestations, its various phases, its mode of propagation; and particularly to show by what means I was enabled to arrest its progress at once.

On the south bank of the basin of Arcachon, is situated Gujan, which contains within its jurisdiction three other hamlets, Mestres, Laruade and Meyran. These different sections are pretty close together, and properly speaking, form one *commune* only. Their total population is about 2,600 inhabitants. These are either farmers, shepherds or seamen, and live in comparative comfort on the product of their labor; they are generally speaking robust; although, in the last few years their constitution has been somewhat impaired by attacks of intermittent fever, which has become endemic in all that section of the country.

Towards the close of October 1853, Margaret D., 26 years old, residing in Gujan, went to Langon, (arrondissement de Bazas,) to see one of her female relations who was attacked by variola. She stayed there 15 days. Though Margaret had been vaccinated in her infancy, as was shown by vaccine cicatrices on both arms, she feared contagion. Consequently she remained as little as possible in the room where the patient was, and took frequent walks in the open fields. She had scarcely got back at home when she was attacked with general uneasiness, pains in the head and back, fever and vomiting. After five days of continued fever, an eruption appeared on the face, the body, and then on the upper and lower limbs. This eruption was clearly defined and offered all the characteristics of variola. After having been simply papular at the outset, it became vesicular, and lastly pustular. The pustules were very close together on the face; they almost run into one another at their circumference, became rounded and exhibited in their centre an umbilicated depression. The period of suppuration came on, and with it secondary fever, swelling of the face and hands, severe pain in the throat, difficulty of swallowing, a partial extinction of the voice, etc., etc. There could consequently be no doubt as to the nature of this eruption. Although very confluent, its course was not impeded by any serious complication, and the pustules dried up on the twenty-fifth day.

During the whole course of her illness, Margaret was nursed by her mother. The latter, 57 years old, who had been vaccinated also, was taken with variola shortly after her daughter's convalescence. In her case, the period of invasion exhibited, amongst other symptoms, very high fever, frequent vomitings and violent delirium. The eruption was very abundant; every part of the body, and particularly the face, was covered with extremely thick and fœtid scabs. Her sight even, was endangered for a time by an inflammation of the corneæ. The fever, very severe from the first, continued without scarcely any alteration during the period of eruption, and assumed renewed intensity at the period of suppuration. Nevertheless, she was cured on the twenty-ninth day.

At this time, that is about the beginning of January, the disease has a tendency to be propagated in an epidemic form. Invading families, it attacked either successively or simultaneously each one of their members. In the month of January the number of individuals attacked by variola exceeded 180; on the 10th February following, it had reached to about 260. The number increased rapidly every day; the epidemic assumed a truly serious form; men and women, whether vaccinated or not, nay, even those who had had variola already, paid an almost equal tribute to the epidemic influence.

I will not cite a long series of individual cases; it would be running the risk of losing myself in details as useless as they would be fastidious, without any benefit to my readers. Besides, the course of the disease was uniform in all the cases. I therefore think it preferable to give a summary of all the characteristics of the epidemic, pointing out particularly any exceptional facts.

Variola was generally propagated by contagion, particularly miasmatic contagion, that is by the breath of the patients and the emanations from their bodies to the surrounding atmosphere. This transmission of the disease occurred principally during convalescence. In exceptional cases it occurred at the suppurating period. Frequently those that were attacked lived at a distance from the seat of infection; they had had no direct communication with infected persons, and were scattered at a distance from one another. In such cases, it was impossible to ascertain the origin of the disease and its mode of propagation; doubtless, these were due to the extreme diffusion of the miasma, or perhaps to that general cause, of which still less is known, designated under the name of epidemic virus, (*génie épidémique*) which produced and developed variola. Lastly, if we may consider the diseases of man as due to external causes; if we may seek for an explanation of their causes, their effects, their nature, and the influence upon them of the agents surrounding man, we must at the same time pay particular attention to special aptitude, and peculiar predispositions in some subjects. Thus, the specific cause, the medical constitution, and the individual aptitude were the three agents which together concurred to generalize the epidemic.

It is difficult to fix the duration of the period of incubation, because, in most cases we cannot ascertain the time at which the system was first influenced by the virus. However, certain facts justify me in believing that it was prolonged from eight to fifteen days. During that period, the patient had vague symptoms, such as headache, uneasiness, a severe kind of tightness in the epigastric region, etc.

In every case the disease was announced by prodroma, which lasted from two to six days. These generally consisted in fever and derangement of the digestive function. I have seen several times, either symptoms of violent cerebral congestion, or free copious hæmorrhages from the nose, or else vomiting which I could scarcely check. Pains in the lumbar region were seldom absent. The fever was generally very high, with exacerbations in the evening; it has often continued even after the eruption had appeared. In the latter cases, the disease assumed a certain degree of gravity. The intensity and duration of the precursory symptoms have not always been in proportion to the nature and confluence of the eruption. Some cases of varioloid were ushered in by symptoms as severe as those of variola. The period of invasion lasted from two to six days. In the case of one patient, whose variola was very severe, this period was almost null; or at least very difficult to make out; the eruption came out without any initial fever.

The course of the eruption was regular. Most generally, the pustules small, flat and confluent, filled slowly, and afterwards became umbilicated; (*s'ombiliquaient*); they rested on a red, tumefied and erysipelatous surface. At other times, they were discreet, developed themselves rapidly, were surrounded by a reddish areöla, became globular, and although without any central depression, they contained true pus. Their form and their development approximated them to varioloid or even to pustular varicella. But their period of suppuration came on with the most clearly defined symptoms, and cleared up all doubts.

The period of suppuration was always accompanied by pretty strong reaction; there were more or less serious derangements of the cerebral or digestive functions, intense fever; burning heat of skin; thirst; sometimes no organ seemed to suffer seriously, but there was excessive debility, a certain degree of stupor—in a word, an aggregation of symptoms calculated to lead us to fear ataxo-adynamia. I have often noticed swelling of the face and hands, and ptyalism. It was also at this period, as well as at that of the drying up of the pustules, that certain affections of the larynx and lungs became evident. The patients complained of difficulty in swallowing, and heat in the throat; there was almost complete aphony; little or no oppression; some cough; percussion and auscultation alone enabled us to discover the existence of an hypostatic pneumonia; the other constituent symptoms of this disease were entirely wanting. Lastly, and particularly in certain patients who had had confluent variola, numerous abscesses were formed during the period of desiccation. These abscesses had not been preceded by fever or disturbance of the system; they were a purely local affectio[illegible] skin was tense, red, painful; a small tumor was formed which beca[illegible]tuating, burst, and discharging small quantities of purulent matter. The healing of these abscesses, which were always confined to the skin and sub-cutaneous cellular tissue, generally took place rapidly.

Hitherto I have only spoken of cases of complete variola, that is, of cases showing all the strength of the epidemic principle. Some cases have exhibited a modified eruption, a varioloid, that is to say, the variola which assails a person when he has lost in a greater or lesser degree, the immunity which vaccination or a prior attack of variola had procured him. The prodroma of varioloid were identical with those of variola. The eruption also offered the greatest analogy; but at a given time, *i. e.*, on the tenth day from the first start, or the fifth after the eruption, the aspect of affairs changed; instead of witnessing fever, swelling of certain parts, and the inflammatory areöla around the pustules come on, we would find the integuments to become pale and sunken; that the pustules cease to increase in size; that they remain acuminated and assume little or none of the navel-like form; that they dry up without breaking, everything terminating on the twelfth day. This mild form was met with only among those who had been vaccinated; it was evidently a varioloid or modified variola, mitigated by vaccination. These two forms of disease, variola and varioloid, are certainly identical; I have seen them arise from the same germ and beget each other; in fact, I could cite instances of patients suffering from variola communicating varioloid, and *vice versa*.

A woman, aged twenty, vaccinated, and having varioloid transmitted to her husband, aged thirty-five, not vaccinated, an eruption which afterwards became confluent variola. How many times in the course of this epidemic, have we not seen variola bring on in another a varioloid!

In some cases, rare it is true, the pustules were wart-like, resistant to the touch, and did not seem to contain any fluid. The lesion of the cuticle, the anatomical sign of this affection sometimes remained in the condition of papulæ, vesicular at their summit, and the vesicles after remaining three days disappeared without conflicting their evolution. A young man, aged twenty-two, vaccinated, had all the prodroma of variola: general uneasiness; great lassitude; pains in the loins; fever; nausea, and vomiting; on the fourth day, there appeared on the face and body an eruption of papular, conical and salient points, the summit of which afterwards became diaphanous and vesicular. Immediately afterwards, his fever went down; the functional derangements ceased; and the eruption, instead of going on to suppuration, disappeared towards the eighth day without leaving any traces.

When variola has gone through all its phases, it has destroyed in the system the predisposition to a new infection. Such is the general rule, and Sydenham has been able to say, with some show of reason: *Nemini parcunt cujuscumque demum ætatis is fuerit, nisi prius hoc morbo laboraverit.* Mead also expresses himself thus: *Experientiâ compertum esse numquam iterum reverti posse variolas.* Notwithstanding, Jenner has expressed doubt on this subject, for he states in very precise terms, that the system cannot be entirely protected from future attacks of variola by one previous attack of the same. For my part, I have been enabled to witness two clear second attacks of variola in two men, one seventy-two and the other sixty-seven years old. The latter, whom I very carefully examined, had had when twelve years old, an attack of variola, which had left on his face indelible scars, and had even caused him to lose his right eye. At the time of my first visit, the poor fellow had a second confluent variola and pustules which had appeared on the left cornea, were seriously endangering its functions.

Lastly, during the course of this epidemic, the eruptive fever of variola, or rather the non-exanthematous variolic fever, (*fièvre variolique*) exhibited its most characteristic features. This fever was not solely due to the modified constitution (*constitution médicale*) of the patient; it was sometimes produced by a true contagion or infection. Amongst others, I will instance the following case: M., aged 59, was seized with confluent variola. At the time of his convalescence, his son, aged 22, who had not left him during his illness, was seized with general uneasiness, headache, fever and pains in the lumbar region; then, there supervened anorexia, nausea, vomiting of bilious matter and want of sleep. This condition lasted six days, that is, the period of the eruptive fever of variola. We expected to see the eruption come out, but it did not, and the patient recovered. This non-eruptive variolic fever was observed especially among vaccinated adults, whose parents had had variola.

What had been the influence of vaccine on the course and severity of this variola? Summing up the facts which came under my observation, I think I may draw therefrom the following conclusions: Among vaccinated subjects, variola never appeared below twelve years of age. The more advanced in life, that is, the further removed from the influence of the vaccine, was the patient, the more severe was the disease. Several families have exhibited striking examples of this extremely remarkable connection between the more or less advanced ages of the patients and the greater or lesser severity of the symptoms. The D. family consists of eight persons, the father, mother and six children; the father and mother had confluent variola; three sons, aged 26, 23 and 22, had it of a less intense character; two sons, aged 18 and 15, had varioloid; the last, aged 12, was the only one exempt, and yet he remained continually in the same room with the patients, and was consequently exposed to the miasmatic influence. In the R. family, seven persons lived in the same house; five of these were seized by the prevailing epidemic; three of the latter had been vaccinated from 20 to 35 years before, and two for 14 and 15 years before. The prodroma and the ernption had the greatest analogy in all these cases; but when the suppnrative period came on, those last vaccinated recovered in a few days, whilst those first vaccinated offered serious symptoms and a tedious suppuration.

In general, it was shown that variola was sensibly modified, and essentially less severe in those persons who had been vaccinated. Its duration was half that of an ordinary variola, and resembled this only in its prodroma and first symptoms up to the suppuration period. When it reached that point, it would be checked, and desiccation would supervene immediately; it seemed to have lost all strength to go further. I have never seen it end in death. If, out of the number of cases, some persons who had been vaccinated have been attacked by variola with all its primitive violence, such cases have been very rare.

We must then concede to vaccination the credit which is due to it: its prophylactic action, if it has not been complete, has been none the less incontrovertible, in conferring upon the disease, in a majority of cases, a marked character of mildness.

In reviewing the course of this epidemic, I find that the first case of variola occurred in November, the second in December, with serious symptoms; and that in January, the disease had become general and had acquired its greatest degree of intensity. In that period of time the number attacked was 260. As to the nature of the eruption, statistics, made with as mnch precision as was possible, have shown that in these 260 cases, there were 190 cases of variola and 70 of varioloid.

Ten patients have died; their ages were: 1, 2, 21, 23, 27, 29, 31, 52, 55 and 57. Not one of these had been vaccinated. Death always occurred at the period of snppuration. In the two infants above and four adnlts, it was produced by the considerable quantity of pnstules with which the skin was covered. These produced a profound adynamic condition, and death came on without any serious lesion to any of the internal organs. In two cases, pneumonia was the cause of the fatal termination of the disease. Lastly, in two other fatal cases, variola was complicated by purpura hæmorrhagica; the skin was mottled by numerous spots of ecchymoses; there had been hæmorrhage from the mouth and rectum.

I have shown the progress of this epidemic of variola up to the 10th February, 1854. It raged freely, and a large number of persons were attacked daily. At this time, on the spot where it reigned, the question of vaccination and re-vaccination had been agitated, and the decision had been against it. It was feared that persons who had submitted to the operation would be more liable to be attacked; that vaccination, instead of being a protection, would only be a complication in this epidemic. I opposed this doctrine as much as I could; and urged the usefulness, the necessity of re-vaccinations. I was ably seconded by M. Bezian, a physician of Gujan, and by the curate and mayor of the *commune*. The people eagerly accepted this prophylactic method, and vaccinations and re-vaccinations were immediately tried on a general scale. In less than ten days we had vaccinated 180, and re-vaccinated 71 persons. The result surpassed our expectations; the disease was immediately arrested.

I deem it important to show the result of these vaccinations. Out of 180 persons vaccinated for the first time, 171 exhibited the true preservative pustules, fit to be used for vaccinating others. On the other 8, no effect was produced.

That vaccine may take twice on the same person, is no more called in question. I thought it proper, however, to endeavor to ascertain how previous vaccination would modify its effect, and what would be the course of the pustules of re-vaccination. Is there a vaccinoid as there is a varioloid? Does the vaccine principle resemble those seeds which perish if planted several times on the same soil?

I append the result of 712 re-vaccinations: on 302 persons it succeeded completely; the pustules were developed on the fourth day, filled from the seventh to the eight, then were surrounded by an erysipelatous areöla, dried up and formed scabs which dropped off on the twentieth day. The pustules had had the navel-like depression in the centre umbilicated; they had incontestably shown all the characteristics of the true vaccine pustules.

In 85 other cases, the pustules were modified; they came on as early as the third day; filled from the fifth to the seventh day with plastic lymph; were surrounded by a reddish circle; and in some cases, even caused swelling of the lymphatic glands of the axilla. These non-umbilicated pustules did not present either tumefaction or induration as true vaccine does; they did not leave, after the scabs had dropped off, any apparent scar. May we not consider this form of eruption as a species of vaccinella, which would be to vaccine what varicella is to variola?

In 119 cases, vaccination produced in the course of twenty-four hours, a pointed red pimple, which disappeared rapidly.

In 206 cases, it produced no apparent effect on the skin.

Almost all those who had been either vaccinated or re-vaccinated, whether successfully or not, were exempted from this variola. There were only five exceptions to this rule. I must say, however, that these had been vaccinated but a few days before the variola appeared. Generally, in epidemics, individuals are subject to the epidemic influence for five days after vaccination. A lad, 12 years of age, who had never been vaccinated, was vaccinated in two places on each arm. Three days afterwards, he had symptoms of variola; the eruption came out rapidly; was confluent and complicated by cerebral symptoms. Just as the pustules were about to suppurate, a sudden change came on; the delirium left him; the pustules began to dry up, and no suppuration took place. At the same time, the vaccinal pustules were developed on the arms with great regularity. At the time this lad was vaccinated, his variola was at its period of incubation, and followed its regular course afterwards; his vaccination was too recent to prevent this. At a later period, the vaccine virus was absorbed; it then acted as a preservative; and would it not seem as if it had neutralized the remaining portion of the variolic ferment and checked this disease in its progress?

I could easily have cited in support of the efficacy of vaccinations and re-vaccinations during an epidemic of variola, many similar cases from the works of the many who have written on the subject; but I preferred giving a plain statement of what I saw during the course of this epidemic, and the conclusions which I drew therefrom after mature consideration.

I close with a summary of my conclusions: 1st. The protective influence of variola is often absolute, but sometimes it is only temporary.

2d. It is difficult to determine the duration of this protective influence; but I think it may be put down at about ten years.

3d. Variola does not seem to to attack individuals at random and without any distinction; it seems to exhibit a kind of partiality, attacking those who have been vaccinated a long time previously, and sparing the newly vaccinated, even during the severest epidemics.

4th. Variola, though not absolutely preservative, exerts a salutary influence on the termination of an attack of variola. It shortens its duration, diminishes its danger.

5th. Since vaccination often protects from variola or modifies it, it is useful; but since its efficacy does not last a lifetime, but ceases at a given time, it is necessary by re-vaccination to renew it, and continue its efficacy.

6th. Re-vaccination onght not in any way to shake our confidence in vaccination; it is calculated on the contrary, to aid it, and supplies that which is imperfect in vaccination.

7th. Re-vaccination, performed at determinate periods, places the individual in the same condition of immunity in which he was after his first vaccination; it is, consequently, a true blessing.

8th. If performed during an epidemic of variola, and in a general manner, re-vaccination checks the progress of the disease; nips the epidemic in the bud; it is undoubtedly preservative; it will modify the disease even in those who, at the time of their re-vaccination, were laboring under the period of incubation of an attack of variola.

9th. Re-vaccination, even during an epidemic of variola, is perfectly innocuous.

10th. It would consequently be desirable that the same zeal which reigned over all Europe in favor of vaccination at its inauguration, should be renewed in favor of re-vaccination as the only means proper to secure complete extinction of variola.

Art. II.—*On the Spots observed in the Progress of Fever, especially considered as a means of Diagnosis:* By Henry Kennedy, A.B., M.B., Censor of the Royal and Queen's College of Physicians; Physician Extra to Sir P. Dun's Hospital. (Read before the Medical Association of the College of Physicians of Dublin.)

Of the several symptoms of fever which have attracted a special notice, the spots which appear in its progress have not received the least. In fact, more attention has been given to them than probably to any other single symptom. Their presence, numbers, and characters, have each in turn given names to particular forms of fever. Many questions connected with these spots are really of much moment; and it has often appeared to me that views prevail with regard to them which facts do not warrant. As an example of what I mean, I would mention the very prevalent idea that the presence or absence of spots at once marks the kind of fever present. Now, this I consider quite incorreet; I have often observed cases of fever to come from the same room—often from the same bed—and yet some of them only to present spots. Or a husband and wife are attacked with fever, and the one is spotted, the other not. Some time since, three brothers, adults, were admitted into Cork street Hospital, under the care of Dr. George Kennedy. They lived together, and were admitted within two days of each other; they had ali heavy fever, but one only was spotted. Will it be maintained that those men suffered from different kinds of fever, merely because one was spotted and the others not? When we see a measly eruption on one member of a family, and a petechial rash on another, and these two come from the same room, are we justified in considering their fevers as different? Will any analogy bear ont this view? Some time back, I saw, with my friend Dr. Denham, five members of the same family laboring under scarlatina; not one of these had the same form of disease. I presume few would maintain that the disease was due to a different poison iu each instance. Yet when precisely a similar occurrence takes place in our ordinary fevers, it is considered by many to be cansed by a variety in the poison; and the presence of spots, above all, makes many look on the disease as something very specific. My own strong conviction is, that all such differences as those alluded to are due, either to the intensity of the poison, or the state of the constitution at the time being; or any cause rather than a difference of the poison. No other explanation, as it appears to me, will account for all the facts of the case; and I think it is time that the opinions spoken of should be abandoned: as, in the first instance, not being supported by facts; and, secondly, as being quite capable of leading to erroneous views of treatment. The varied types of fever are, I believe, due to entirely different causes than specific poisons for each; but a consideration of these points does not come within the scope of the present remarks.

A second point which I would notice before entering on the more immediate subject of this paper is, as to whether there is anything of a specific character in the fever of this country. In 1847-48 the expression "Irish fever," was to be found through all the public papers of our neighbours on the other side of the channel. It became almost a fashionable expression; and the words themselves were the means of conveying more than an insinuation that the epidemic fever which then prevailed began in Ireland, and was carried by our people in every direction. Some even of our professional brethren, especially in Scotland, took up this view of the matter. Now I freely admit that sickness may be carried from this side of the channel to the other, and *vice versa;* but whilst admitting this, there are two points which are not to be lost sight of. First, there is no fever peculiar to this country, as distinguished from what is seen in England and Scotland. There is no "Irish fever," properly so called; and on this point I appeal to the descriptions of the disease published by English physicians themselves.* But secondly, and this is the important point to notice—there exists the clearest evidence to show, that before we had epidemic fever here in 1847–48, the disease had increased much in England. Nor is this a solitary instance in point. There is a great law affecting all the more

* Petechial fever is certainly not the peculiar disease of this country. I have never seen the majority of cases, at any one period, present spots of any kind; nor indeed has there been any approach to this. One spotted case in every five, I have seen; but even this is rare. In 1847-48, cases attended by spots were very exceptional.

wide-spread epidemics, and showing that their course across the globe is from east to west, or from south-east to north-west.

At a certain period of some cases of fever, it is well known that spots make their appearance. This is usually from the sixth to the ninth day of the disease; but on this point there are great differences. I think it may be stated that they will be occasionally seen as early as the third day, reckoning from the period of the rigor. There are difficulties, however, in determining this; for it by no means follows that the patient is not ill before the rigor. Still, some of the cases I have seen were inquired into as minutely as was possible, and the spots did appear then on the third day. On the other hand they are often much later than what is usual in making their appearance. Thus I have seen them as late as the twentieth day; and very critical cases all such in general were. But there is another and more important point still to be noticed as to the time of their appearance. I allude to those cases where the fever is made up of two parts, with an interval between. Here they may be absent in the first and present in the second, and *vice versa;* though the last is not as common as the first. I have notes of more than one case where the individual passed through three distinct fevers before leaving the hospital; yet it was only in one of the series that spots appeared.* And alluding to the question of any individual ever having spotted fever a second time, I may state that it has not come under my notice; though my friend Dr. George Kennedy has seen it, but very rarely.

There is still one other point worthy of notice in connection with the period when spots appear; I mean cases where we would have every reason to suppose that they would appear at the same time. As an example I may mention that not long since two sisters, both grown women, and remarkable for their great stature, were admitted into Cork street Hospital, laboring under heavy fever. They each exhibited spots; yet one of them was spotted four clear days before the other. The fact is of interest, as showing how the constitution will modify the eruption; for there was no other explanation, which in this particular instance, would account for it. These two sisters had sickened at the same time. Precisely an analogous circumstance has come under my notice in scarlatina; that is, the period at which the rash appears will vary by three or four days, though children of the same family have sickened together.

The spots of fever may exhibit themselves, as is well known, over the whole body. But in general they are more limited than this. Where they first appear I will not take on myself to determine; though I believe they will be as early seen about the pectoral muscles as anywhere else. There are some modifications of them, however, having relation to their site, which appear to me worthy of notice. Thus it is by no means uncommon to see them exclusively confined to the upper part of the body. Not one will be seen on the lower limbs.† Again, I have seen them confined, and in the most marked manner, to the

* It is the last of the series which exhibits the spots in these instances. In one case of this kind I find it was the fourth attack, and the spots then were of the character of measly eruption.

† I have seen them, too, nearly exclusively confined to the abdomen ; but not absolutely.

joints. Not loug since, a young man of 18 was admitted into Cork street Hospital, under Dr. George Kennedy. He was very seriously ill, his fever being marked by prolonged vomiting, of a character such as my friend, Dr. Fraser, has drawn attention to. His pulse rapid and very weak. Great distress. In the course of his illness, his elbows and knees exhibited spots, each in number probably of from forty to fifty. I could not detect a single spot anywhere else. Their character partook of a mixture of purpura and petechiæ, and they appeared to me to be slightly raised. The case recovered. Dr. Kennedy informs me he has seen several similar instances. I have now seen many cases where the spots were first visible on the backs of the wrists; and usnally they have here been of a bright-red color. I have seen also instances where they were located in patches, as it were, and these symmetrical, on either pectoral muscle. In one instance well marked spots, of a bright hue, came out over the whole front of the throat and neck, and the inside of either elbow, nor could I detect any elsewhere.

Lastly, I have seen spots on the face and forehead; and I mention this particularly, because some observers have asserted that they are never seen here. This is certainly incorrect. I have notes of some eight cases, which may now be increased to elevcu, where there could be no question of the fact. Last autnmn, a man named Speight passed through a severe attack of acute rheumatism. He had recovered so far as to have left hospital a fortnight, when he was re-admitted laboring under one of the worst forms of fever. He was very generally and densely spotted; and on the thirteenth day of the attack, a crop of petechiæ was as distinct on the face and forehead, as on any other part of the body. This case recovered.* The way then to speak of the fact is, as being very rare, in comparison with the number of cases which exhibit spots elsewhere; but to say it does not occnr at all is going farther than facts will justify. I think I have seen spots on the conjunctivæ, or at least what might be described as a mottled state of this membrane; and instances are not uncommon where a ruptnre of a blood-vessel, or an exudation of blood, has caused a distinct ecchymosis—I mean of course in fever. Is it straining the fact too far to suppose that such a spot is but an ordinary petechia in an unusual place? I have never seen the occurrence in fever except in conjunction with spots elsewhere.

The character of the spots of fever has long attracted notice, and some of them unquestionably deserve a special attention; but for reasons, some of which have been already givcu, while commencing these remarks, it appears to me too much stress has been laid on this point. Thus the bright, well-defined, lenticular spots are, I believe, constantly spoken of as being different from what are called genuine petechiæ. Now I cannot but think this is au erroneous way of considering the matter; and for the simple reason that they may be very often seen existing together, at the same time, and on the one patient. In this way we may find the bright, well-defined spots on the arms, and

* Louis, I find, gives one instance where spots were visible on the face.

the petechiæ on the body.* Of such I have seen several cases. Or again, we may see one member of a family presenting the bright spots and another the petechiæ; yet both have come from the same room. Speaking of the two kinds of eruption reminds me that some of the older authors on fever have described two crops as occurring in the one patient. This I have seen in the most marked form, not only in fever, but also in scarlatina. And in truth the analogies which the exanthemata hold, one with the other, does not appear to me to have received that consideration which they deserve. Who has not seen cases of scarlatina presenting on the surface different hues of eruption, I mean at the same time? Purpuric spots, great patches of redness of different hues, universal redness of the entire surface, and above all, spots, not possible to distinguish from what are called genuine petechiæ, may be mixed up together in the one patient; to say nothing of the varieties which the disease so often presents when going through an entire family. Now under such circumstances no one ever dreams of saying there are different poisons, according to the varied hues of the rash; yet when exactly analogous facts occur in common fever, some inexplicable necessity seems to arise for drawing distinctions where there are in reality none, and refining to a degree which, it appears to me, facts do not justify. That much valuable information—more especially as regards prognosis—may be derived from close observation of the eruption which common fever exhibits, is readily admitted; such as the brighter or darker hue which it presents; the greater or lesser size of the spots; their early or their late appearance, etc. But these points, let it be observed, are quite beside the question of whether the varieties which we see in the rash of common fever be due to separate and specific poisons, or only to one; and whether it be not more consistent with facts to attribute them rather to the temperament of the patient, the state of his general health at the time being, his age, etc., rather than to this or that poison. And this leads on to a question in direct connection with this part of the subject, about which more has been written than on any other; that is, the distinction which exists, or is said to exist, in the rash of typhus, as distinguished from the fever attended by local lesion in the small intestine, and known as typhoid fever.† On this point, I belive, authors have been too precise, and have not made allowance for the possibility of deviations, which here, as indeed in every other point connected with fever, are liable to arise. Thus, from the perusal of the most recent works on the subject, one would suppose that typhoid fever could not exist without the presence of bright lenticular spots, few in number, and disappearing long before the fever ends. Now I do not deny that this state generally obtains; but I do say that it is by no means constant. I have observed cases from the very beginning to the death of the patient, and to a *post mortem* examination,

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* At this very time (January, 1857) I have a patient in fever in Dun's Hospital, who exhibits bright spots on the wrists and arms, and well-marked and dark petechiæ on the chest. She is a girl of 19.

† So far back as 1837, I published, in the *Dublin Medical Journal*, a paper on this very subject. It contained, I believe, every point which has since been advanced as a means of diagnosis between typhus and typhoid fever. The paper has been acknowledged in America, but ignored in London, where much labor has been spent by Dr. Jenner in determining what was known twenty years previously.

disclosing ulcerations of the small intestine; and yet from first to last no spots whatever were visible. And the opposite of this, again, is still more common. I have notes of a number of cases where the spots had all the characteristics, as to time, number, size, and disappearance, and yet the cases had no other symptom whatever of enteric fever, and in reality were not the disease at all.* With such facts in view, it appears to me great caution should be used in pronouncing any spots as diagnostic of this or that kind of fever; or at least of giving them more weight than any other single symptom of the disease is entitled to. It may be observed in passing, that the number of cases in which bright, well-defined spots, and few in number, have come under my notice, within the last three months, has been truly remarkable. I recollect nothing like it in previous years. Is it necessary to add that these spots were not diagnostic of enteric fever at all.

It has been already stated that much valuable aid, in a prognostic point of view, may be derived from the spots which appear in fever; and I believe it is generally admitted that the darker and larger they are the more serious is the case. In my own experience this has been so; and the worst cases I have ever seen have been attended with few spots of a large size, and confined very generally to the region of the clavicles and groins, sometimes running down the inner side of the thighs.† A much rarer appearance than this I have also observed, and if it be possible showing a more malignant form of disease; I mean where the subcutaneous veins of both the upper and lower extremities have allowed a bloody serum to exude, which is quite visible through the skin. With this state I have found in the pleura, and also the pericardium, and on the surface of the brain, serum poured out which was likewise tinged deeply with blood. In one instance I found a large effusion of blood under the pleura covering the left lung.

Of the supervention of fever in persons afflicted at the time with chronic diseases, I presume all who hear me have seen examples. I mean fever attended with spots. Thus I have met several examples of persons who were hemiplegic, and in this state were attacked with petechial fever; and again, others who labored under chronic bronchitis and asthma. Cases of phthisis, too, have come under my notice in a similar way; but the fever in these instances has been rarely attended with spots. This latter, however, I have witnessed, the rash being most copious. Cases of chronic affections of the eyes, ulcers of the legs, and chronic diseases of the skin, are of very common occurrence in union with spotted fever. Lastly, I have witnessed fever, and in its very worst forms, with both primary and secondary syphilis. It is worthy of notice how little any of these affections are altered by the fever. Speaking generally of them, they are certainly not made worse; though such might be expected; at least of some of them. I have, however, seen

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* I have also witnessed cases where all the symptoms were those of enteric fever, except that the spots were dark on the chest; and in the inguinal regions, assumed the character of purpura. I find notes, also, of one case where the spots were genuine petechiæ, and where ulceration of the bowels was found

† It is worthy of notice that these large and dark petechiæ, or by whatever name they are called, are not confined to typhus, but may be seen in puerperal fever, and in some cases of malignant scarlatina.

cases of disease of the skin, where it was got rid of, after the fever. But usually they go on as they did before. In my own experience it is only a state of derangement of the general health, and not any specific affection, which is likely to be bettered by spotted fever.

It may possibly not be out of place to put the above into a series of propositions.

1. That there is no form of fever peculiar to Ireland.
2. That in 1847–48, the epidemic which then prevailed in Ireland had existed in England for months previously.
3. That this epidemic, like all other great ones, traveled from east to west.
4. That the idea of different poisons, as a cause of the several varieties of rash, does not appear to be borne out by facts.
5. That the analogies derived from the study of the exanthemata are opposed to the idea of there being more than one poison.
6. That red and dark petechiæ may co-exist in the same patient, at the same time.
7. That either may precede the other. That some members of a family may exhibit spots—others not; all being ill at the same time.
8. That petechiæ may be almost exclusively confined to the abdomen, or to the upper half of the body; or exhibited in groups on the pectoral muscles, the front of the larynx, or strictly confined to the knees or elbows.
9. That they may be seen occasionally, but unequivocally, displayed on the face, and possibly on the conjunctivæ.
10. That bright lenticular spots, and few in number, are of frequent occurrence, without any other symptoms of enteric fever.
11. That fever without intestinal lesion may exist without any spots whatever.
12. That the same lesion may exist with dark petechiæ.
13. That petechial fever may run its course in patients affected with such diseases as hemiplegia, phthisis, syphilis, etc.
14. That large, dark petechiæ are not confined to typhus, but may be seen in puerperal fever, and cases of malignant scarlatina.
15. That in some very bad forms of fever, the veins allow the blood to exude in a very striking way; and together with this, serum, deeply tinged with blood, may be found poured out in the serous cavities.—*Dublin Hosp. Gazette*, *April*, 1857.

Art. III.—*On the Physical Climate of Scutari; and on the Nature of the Diseases of the Allied Troops during the Russian War, in* 1853, 1854, *and* 1855: By William Aitken, M. D., Edin., L.R.C.S.E., Corresponding Member of the Society of Medicine and Natural History of Dresden, and of the Royal Imperial Society of Physicians of Vienna, late Commissioner at Scutari.

[To *The Glasgow Medical Journal*, (April, 1857, Quarterly,) Dr. Aitken has contributed an extended paper, having the title above mentioned, which is to be continued, and from which a few extracts will be here reproduced as being not only illustrative of the sanitary conditions incidental to army operations, but also applying more or less to the great civil migrations under foreign skies, in new climates, and amid physical privations. In war as in peace, these great movements of humanity are so many instructive experiments upon a vast scale, showing the essential connection which exists between health and the physical comforts, especially among large aggregations of human beings in ships, mines, camps, and cities. Bullets and bayonets, swords and great guns, and all the destructive arms of war, by sea and land, prove less dangerous to conflicting armies than preventable diseases, provided the medical department be skilful and be well supplied with the means essential for the sick. Without the latter, Homer's view of the faculty cannot be realized:

> "A wise physician, skill'd our wounds to heal,
> Is more than armies to the public weal."

There is reason to believe that the British army of the Crimea, as well as the late American army of Mexico, was not provided with the "wise-physician" in many instances.]

The events of the late war against Russia will long furnish matter for the gravest reflection to the statesman, the warrior, and the physician. To the latter the subject teems with questions of the greatest interest; and when all the more minute details of the campaigns in Asia Minor, Bulgaria, and the Crimea become developed on the page of History, or recorded in such shapes and forms as can conveniently be referred to, the physician may then be able to form his judgment regarding the nature of those diseases which, at various times and places during the war, proved so fatal to the allied armies.

Scutari and Constantinople were the head-quarters respectively for the reception of the sick of the British and the French forces, during the greater period of the war; and the experience to be acquired in the numerous and extensive hospitals of the French, Sardinian, and British troops, was of the most comprehensive description.

The mean temperature of Scutari is almost intermediate between that of the south of England, in the vicinity of the sea (Jersey), and that of Calcutta, as shown in the following table:

	Jan.	Feb.	Mar.	Ap'l.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Calcutta......	66°2	69°8	80°0	85°4	85°7	83°7	81°8	82° 0	82°0	79°2	74°2	66°6
Scutari........	47°2	48°7	54°7	62°6	68°3	76°6	74°4	73°25	60°5	66°6	58°6	49°6
Jersey........	33°0	30°0	33°0	49°3	50°9	54°6	60°9	61° 1	61°0	54°1	46°4	46°4

At Calcutta, the greatest daily range of temperature takes place in December and January, when it amounts to about 18°; the least range is in July, when it is about 6°.

At Scutari, the greatest daily range of temperature took place in July and September, when it amounted to 27° and 23°; the least in December, when it amounted to 15°.

Scutari lies in a direction about two miles east of the entrance to the Golden Horn, the port of Constantinople, and somewhat to the north of 41° of North latitude.

On the physical climate of Scutari, the effects of the absence of tidal influence on the shores of the Sea of Marmora must be taken into account. Where tides exist, decaying substances may be borne in now and then, but they have also a chance of being carried out again to the flowing current by the retiring tide. This is not the condition along the shores of the Sea of Marmora, and especially in the bays and inlets along the coast in the vicinity of Scutari. The water may be said to be in a measure stagnant, while it rippled almost imperceptibly on the shore. "In it there floated all forms of nastiness and corruption, which the prowling dogs, standing leg-deep as they waded about in search of offal, could not destroy." The smell from some parts of the shore was sometimes of the most noisome description, and emanated from the decaying carcasses of sheep, cattle, horses, dogs, birds, straws, sticks, vegetables, and sea-weed, and, in short, from all imaginable possible kinds of abomination, the result of decaying organic existence.

The historian who would give a full and accurate account of the medical experience of the late war with Russia, must bestow some care in bringing out the events of the following periods, some of which constitute the most important epochs in the medical history of the war, namely:

1. The period after the short residence at Gallipoli and Scutari, when the campaign of Bulgaria opens up with the sickness, disease, and mortality of the camps there.
2. The period when the men sailed from Varna to the shores of the Crimea, and the march from Old Fort to Balaklava.
3. The eventful history of the sickness, disease, and deaths in the camp before Sebastopol and at Balaklava.
4. The sickness, disease, and deaths during the transportation of the troops to the various camps and subsidiary commands in Turkey, and the seat of war in the Crimea; and more especially the deportation of the sick from the Crimea to Scutari, Kulalee, Therapia, Constantinople, Smyrna, Abydos, and Renkioi.
5. Nature of the sickness and diseases in the Russian camps, and their arrangements for the sick and wounded on the march.
6. The period when unprecedented services were rendered by Miss Florence Nightingale in the care of the sick and wounded.

Of the Physical Climate of Bulgaria, and the Sickness, Disease, and Mortality in the Camps there.—At Scutari, there was encamped from the end of April till the 13th of June, 1854, troops to the number of 12,000 men of cavalry and infantry; and the whole force, with few exceptions, lived under canvas. The ground they occupied was comparatively high, and appeared dry. For a fortnight towards the end of April, the weather had been changeable, with occasional showers. The temperature was moderate, but variable, a hot day being frequently followed by chilly or cold nights. During the encampment here at this time, the health of the troops was good, but the fatal cases which occurred, though resulting from ordinary disease, were marked by an unusually rapid course. There appeared to be no decided tendency to the prevalence of any particular disease. A few cases of small-pox became developed at Gallipoli, and two cases were reported in the 95th regiment at Scutari.

Between the 1st and the 15th of June, the British troops embarked at Scutari for Varna in good health. The total force was reviewed on the anniversary of our Queen's birthday, amounting to about 15,000 men, who, for weight, stature, and strength, could not be surpassed by any troops in Europe. The Light Division embarked on the 1st of June; the Brigade of Guards on the 15th.

They were now to proceed to Bulgaria, a country, the resources and nature of which we knew little in a medical point of view. There they occupied camps at Varna, Aladyn, Devno, Gevrlekler, Monastir, Yeni-bazar, and Shumla, during a period of ten to twelve weeks. This period is a melancholy era in the medical history of the war.

Nature of the Diseases and Sickness.—The British army was scattered "broadcast" over a country from Monastir to Varna, a distance of 27 miles—a district known to be pernicious to the health of man, and, notwithstanding its exquisite beauty, a hot-bed of pestilence, disease, and death. Diarrhœa, cholera, fever, and dysentery soon verified by their ravages the name which the Turks gave to Devno, namely, "the Valley of Death." What at first sight seemed to be natural advantages, such as beauty of scenery, varied by hill and dale, wood, water, and vegetation, contained, at the same time, abundant evidence to the scientific that the elements of insalubrity existed also; and it may not be useless now to enumerate the unfavorable elements, which characterized the physical climate of the place.

1. In the mornings and evenings the encampments were often enveloped in dense and thick mists which appeared to come from the lakes. In the words of Russell, "the lake and the streams may be said to have exhaled death, and at night fat unctuous vapors rose up fold after fold from the valleys; creeping up in the dark, they stole into the tent of the sleeper, and wrapt him in their deadly embrace."

2. Green wood and brushwood had to be cut down to make ground for the tents to be pitched upon; a proceeding of the most imprudent kind in a sanative point of view, as is well known to the settlers in America and in India.

3. The marshy nature of the vegetation in the meadow lands, combined with the presence of amphibious animals of the batrachian kind, such as frogs and tortoises. The presence of the *Rana variabilis* is considered an unerring indication of an unwholesome and marshy locality.

4. The presence of innumerable flies of all shapes and color, and clouds of locusts, followed by numerous flocks of insect-eating birds, combine to point out an unhealthy physical climate.

5. The nature of the soil, combined with these features, would indicate to the geologist the unhealthy nature of the district.

6. The range of temperature.

The story of sickness, disease, and death in the Bulgarian camps may be related in a few words. About the middle of June, diarrhœa prevailed to a great extent in the camp of the Light Division, then at Aladyn. The men at that time were living on "ration brown bread" and water for breakfast, after which they were paraded and exercised for an hour or two in the hot sun (on one occasion four hours). The dinners consisted of lean "ration beef," boiled in water, and eaten with brown bread, without any seasoning to flavor it. No rice, sugar, tea, or vegetables were supplied, and the men drank the red wine of the country in abundance. They gradually left this camp and slowly advanced to Devno. It was considered by some that the neighborhood of Varna was not unhealthy; but simply that the large force, particularly of the French army, keeping so close round Varna, made it unhealthy: there were also about 7,000 Turkish and Egyptian troops in the vicinity. Cholera first broke out amongst the French troops at Varna, the Turks and Egyptian troops being also then sickly. Of those first attacked, 16 out of 25 men died, and diarrhœa became generally prevalent among the English troops.

About a month before embarking for the Crimea, cholera prevailed generally throughout all the troops.

General Health of the Troops in Bulgaria.—The general condition of the troops at Varna may be described as "*sickly.*" They were "*using up*" while there, to use the words of Dr. Mapleton. An estimated per centage of illness or sickness of the army during their twelve weeks' residence here, cannot be stated. Many men were weak and ill, and lost flesh rapidly, though they were not under medical care in hospital; and when asked as to their health, they could not definitely say what ailed them. The troops were depressed in spirits from inaction, and were terror-stricken from the suddenness and fatality of the attacks of disease. Long drills—which were put an end to by Lord Raglan—combined with bad tents, great heat, cold and dewy nights, fogs, morning and evening mists, great range of temperature, sour brown bread and ill-assorted food, combined to "use up" the strength of the men, and to put the army into that very unsatisfactory state in which it was previous to the embarkation for the Crimea.

Much difference of opinion prevails, both amongst professional and non-professional people, as to the healthiness of coarse brown bread; that is, bread composed of the whole wheat, merely crushed, without having been freed from the envelope of the seed. There can be no doubt that it is beneficial to many, as the irritation of the husks left of the grain tends to keep bowels open which may be naturally sluggish; but in districts where irritation of the bowels prevails, such bread must have an injurious tendency, even when well baked. But, supposing the wheat to be pure, every one knows how difficult it is to get such brown bread well and sufficiently baked. In consequence of the seed being crushed with its husk, the ferment acts less easily upon it, and the dough requires longer time to rise than dough composed of fine wheat flour. The consequence is, that brown bread is, for the most part, damp and sodden in the centre of the loaf, and very soon turns more or less sour. Snch bread is badly baked in the first instance, and afterwards undergoes a change by which it becomes sour—a change which very readily and soon takes place in hot weather. Such was the condition of the bread in Bnlgaria, and also often throughout the following campaign. But that was not all: the wheat from which the bread was baked, consisted of barley, rye, and a black sort of seed, amounting to a fifth part of the whole sample; and it is said that clean wheat could not be got in the country, owing to the slovenly system of farming there. Is it a wonder, then, that such "brown ration bread" was most decidedly liable to cause bowel complaint, and was food of a dangerous kind in snch a country and climate, especially when cholera prevailed?

Third Report of the Committee on the Army before Sebastopol, dated March 14th, 1855: This return shows "the total nnmber of men of Lord Raglan's army, sick and wounded (of all arms), during each month from the landing in Turkey." It is as follows:

1854.		
April,	503	Average strength. 25,000.
May,	1835	
June,	3498	
July,	6937	
August,	11,236	
September,	11,693	
October,	11,988	
November,	16,846	
December,	19,479	
1855.		
January,	23,076	
February (to latest date),	19,964	

Concerning this return, one of the most eminent statists of this country (W. B. Hodge, Esq., Fellow of the Statistical Society of London) has the following strictnres: "These retnrns are found not to represent the average nnmbers sick during each month, but the total of those applying for assistance at the hospitals, and they cannot therefore be used to ascertain the average number of the sick."

We have also the following data from which to reckon the amount of sickness in the army of Lord Raglan when it left Varna for the Crimea.

The morning state of the army on the 2d of Ootober, 1854, was as follows (*Appendix to Third Report*, p. 473):

Officers,	1,084
Rank and File and other effectives,	27,865
Sick,	6,777
Total of Lord Raglan's army on 2d October,	35,726

Of these 35,726 men there were 6,777 sick, being at the rate of 173 per 1,000 men. Among these the wonnded of the battle of the Alma are included. The wounded at that battle consisted of 1,619, men and officers together. The number of sick present with the army at Balaklava on the 2d October was 328. At Scutari there were about 200 sick when the army left Varna. Deducting now the wounded at the Alma, the sick at camp at Balaklava, and the sick at Scutari, in all 2,147, there remains for the sick at Varna 4,630, and which, upon the total strength of the army at the period when the battle of Alma was fought, which amounted to 26,800 men—(*Appendix* 473, *Return No.* 5) —is at the rate of 173 men sick at Varna for every 1,000 men able to take part in the fight, or more than one-seventh part of the whole force was sick at Varna.

Of the Sickness, Disease, and Deaths in the British Army during the period embraced in the time when the Allied Forces embarked at Varna, and arrived in Balaklava.—The time embraced in this period is from the 4th till the 26th of September, 1854, and it is marked by the following epochs, namely: *first, the embarkation and the rendezvous in Baltschik Bay; second, the landing at Old Fort on the* 14*th of September; third, the adventures of the army during the first six days in the Crimea; fourth, the battle of the Alma on the* 20*th September; fifth, the famous Flank March and arrival at Balaklava on the* 26*th.* All these are embraced in a period of 22 days. During this short time the strength of the British army was diminished by 5,053 men. Of these, 353 were killed at Alma (*Third Report of Sebastopol Committee*, p. 473), 1,867 were wounded there (*loc. cit.*), 316 succumbed from disease or death, and 2,237 were sent sick to Scutari.

As there is no direct official document which states the above results in so many words, it is necessary for me to state the data whence I have derived the information.

First, then, it is approximately concluded that 28,053 men and officers embarked at Varna; secondly, it is stated by Major-General Bentinck, that about 23,000 men arrived at Balaklava by the flank march on the 26th September. Thus it is shown that the army lost in strength during this period 5,053 men. These are *officially* accounted for as follows:

Killed at Alma,	353
Wounded there,	1,867

We know also that, from the 18th till the 24th of September, there were sent from the Crimea to Scutari 4,104 men, including the wounded. (*Second Report*, p. 706.) The killed, the wounded, and the sick of the Crimea are thus represented by the number 4,457, up till the 24th September when the famous flank march commenced. If now we deduct this number from the difference between the number embarked at Varna and the number which arrived at Balaklava, we have 596 men to account for as rendered ineffective on the flank march. The numbers now stand as follows:

Killed at Alma,	353	
Wounded there,	1,867	=4,104
Sent to Scutari sick,	2,237	
Loss on the Flank March,	596	
Total,	5,053	
From casualities alone the loss was,		2,220
From sickness (of whom it is not known how many died)		2,833

The ratios of loss per 1,000 men on the number landed (namely 27,600) during twenty-two days may therefore be thus stated:

From disease alone,..................	102 per 1,000
From killed and wounded,...........	81 per 1,000
All causes,..........................	183 per 1,000

No one can review the records of this short period without lamenting the extreme uncertainty in the results of arrangements made, and the criminal neglect of the life of the British soldier. The hard-worked medical men of the British army were put, during this period, in an utterly helpless state, so far as they could be useful to the sick. They were put in a position disgraceful to humanity, and insulting to their profession. There is perhaps no other civilized nation in which military arrangements and the operations of war are conducted with so little deference to the judgment, and regardless of the advice of the medical profession, as is the case with the army of Great Britain. The French pay the greatest deference to the opinions of the medical element of their army; but with us it is not so: and much of the loss of the British army, during the time we are now considering, is to be attributed to the non-compliance with the requisitions of Sir John Hall, and the absolutely necessary requirements of the medical staff.

Thus also writes Ch. B. Hearn, Esq., the surgeon of the 1st Royals: "The chief cause of the great sufferings of the sick and wounded of the British army may, I fully believe, be traced to the general, and, indeed, almost incredible apathy evinced by the authorities from the very outset of the expedition, with regard to everything connected with the medical department. When we sailed for the Crimea, we were obliged to leave behind us a new regimental medicine chest, that had been issued at home expressly on account of our embarkation for active service, and, in fact, everything, except two small panniers containing surgical instruments and a supply of medicine, which, as regarded quantity and variety, was most miserably scanty, with hospital canteens A and B, the sets of bedding that accompanied them, and the hospital marquee. No ambulance or vehicles of any description were allowed to be embarked, nor was any provision made for the conveyance of the wearied, sick, or wounded soldier, who had to endure a long march, and fight his way through an enemy's country, unless the ten stretchers given over to the band, who were also encumbered with their own packs and accoutrements, could be considered as such. Before we commenced our march from the landing at Old Fort, the hospital marquee, canteens, and bedding, were ordered to be reëmbarked, and there were but four water mules for the whole battalion. The sick or wounded were, in short, to all appearance, thrown entirely overboard, one small circular tent only being allowed for a whole regiment. The consequences soon became apparent. When men fell out of the ranks from exhaustion, or were seized with sudden disease, of which cholera was the most frequent, the medical officers could render no effectual aid. The regiment moved on, and the victims were compelled either to drag themselves miserably along or to perish where they lay. In short, they were left to their fate. The history of Alma is but too painfully true.

There were no means of carrying the wonnded off the field, except the few bearers already allnded to; and whilst on the day following the battle there was not a wounded Frenchman on the ground, it was disgraceful to the British nation to see, even on the second day, many of its brave defenders suffering, withont any human aid, where they fell."

Art. IV.—*Pulmonary Consumption.*

1. *The influence of Sea Voyages and Warm Climates on the progress of Pulmonary Consumption:* By M. Jules Rochard.—The following conclusions are arrived at on this subject by Mr. Rochard, after a most elaborate investigation of the subject. His paper is published in the "Memoirs of the Academy of Medecine of Paris," for 1856, and is an "ouvrage conronné dans la séance publique du 11 Décembre, 1855."

1. Sea voyages accelerate the progress of pulmonary tuberculization, much more frequently than they retard it.

2. This disease, far from being rare among marines, is, on the contrary, mnch more common among them than in the land army. It prevails with equal intensity in the hospitals of our ports, in our stations, in onr fleets. The "officiers de marine," the physicians, the commissaries, all who are afloat, in a word, are subjected to this general law.

3. With rare exceptions, which must be admitted, considering some facts recorded by men of credit, phthisis advances on board ship with more rapidity than ashore.

4. The naval profession shonld be interdicted, in the most decided manner, to all youths who appeared to be menaced with phthisis.

5. The consumptive can get no advantage from sea voyages, except they be on board nnder certain special hygienic conditions, and change climate and locality according to the seasons and atmospheric vicissitudes; things which cannot be realized on board of ships with a mission to fulfil. Jonrneys by land, and prolonged stay in a well-selected country, allow of all the same objects being attained, with mnch less expense and danger.

6. Warm countries, taken as a whole, exercise an injurious influence on the progress of pulmonary tuberculization, and accelerate its course.

7. Those situated in the torrid zone are especially injurious, and stay there shonld be formally interdicted to the phthisical. The opinions of the physicians-in-chief of our colonies, and of the English colonies, comparative statistics of colonial and of European regiments in the two sets of conntries, the frequency of phthisis in our tropical stations, and in those of England in the same latitudes, and a mnltitude of special observations, demonstrate this completely, and the examination of each particular locality confirms it.

8. Most hot climates, situated outside of the torrid zone, are equally injurious to the tuberculous. Some points on the confines of this region, and concentrated in a narrow space, are exceptions. This is owing to local conditions. To sojourn in them protects the phthisical from acute affections of the respiratory passages which accelerate the progress of tuberculization, permits a mode of life better adapted to keeping up the general strength, prolongs existence sometimes, and contributes always to a more easy termination of the same.

9. It is in the first stage of phthisis that there is any hope from emigration, and any reason to expect good results from it.

The localities to be recommended to the consumptive M. Rochard divides into four series, according to their respective advantages:

1. Madeira. 2. Hyères, Venice, and Pisa. 3. Rome, Nice, of which the reputation is constantly decreasing. 4. Menton, Villa Franche, Bay of Spezzia, Lake of Como, the Balearic Isles, the Shores of Greece, the North of Egypt, Algeria.—*Abs. Med. Sci., from Edin. Med. Jour.*

2. *Outline of Hygienic Code for the treatment of Consumption:* By BENJAMIN W. RICHARDSON, M. D., Physician to the Royal Infirmary for Diseases of the Chest. (*The Journal of Public Health, Abst. Med. Sci.*)

In giving the following rules, Dr. Richardson presupposes their general applicability to cases of consumption in all stages of the disease: in the premonitory stage; in the stage where the tubercular disposition is apparent; and in the next stage, when the local mischief is much further advanced. In the last stage even, though hope is lost, many of the rules may still be rigidly followed out with advantage, for by them the course of the disease may be smoothed, and life, perhaps, prolonged.

The Rules are ten in number.

RULE 1.—*A supply of pure air for respiration is the first indication in the treatment of the consumptive patient.*

No cosy room with a temperature of 70°, with every crevice closed, and with an atmosphere in a dead calm and laden with impurities, should be permitted. A temperature from 55° to 65° Fahr. is high enough. The fire, if one be wanted, should be in an open grate, and every arrangement should be made by which the freest possible current of air should be kept circulating through the room. If the patient is cold, he must go near the fire, and, if necessary, poke it, but he must on no account make the room warm by making it close. Dr. Richardson objects very strongly to stoves of all kinds, to heated pipes, and to every other mode of supplying warmth, except an open fire, as by these means the air is made too dry. Among other disadvantages attending the inhalation of a too dry air, is hæmoptysis, and a case is mentioned in point. "A gentleman whom I knew, and whose lungs were free from tubercle and other organic disorder, was constantly annoyed and troubled with slight attacks of hacking cough and blood-spitting. He was at a loss to account for the cause. At last he detected that the attacks always commenced when he was at work in his study. With the idea of being very warm and comfortable, and ignorant of the nature of animal heat, he had introduced into a small room a large Burton's stove. To a stranger entering that room when the stove was in action, and the doors and windows snugly closed, the heat and dryness of the atmosphere would have been at once oppressive; but he, a close student, and constantly occupying the room under such conditions, had become accustomed to it as regards external sensation, but caught the mischief effectually in the chest. The cause of the symptoms being explained, the stove was abandoned, and the open fire-grate was again resorted to: the cough and blood-spitting at once disappeared without the administration of any medicine. A few weeks afterwards, thinking that the stove and the cough might only stand in the position of coincidences, our student resumed the use of the stove; and what is more, resumed also, as an effect, the cough and the blood expectoration. This time he became assured that the stove and the cough stood in the relation of cause and effect. The cause was once more removed, and ever since he has remained free of the effect." Free ventilation is especially necessary where gas is used. The bedroom should be large—including, if practicable, not less than 1000 cubic feet of breathing space; and, to prevent any unnecessary contamination of the air, no second person should sleep in the same room, and no light, particularly gas, should be burnt through the night. Two persons in one bed, according to Dr. Richardson, are out of the question under any circumstances. The inclemencies of the weather are not so much to be dreaded as confinement to the house. "I had occasion, some time since," says the author, "repeatedly to remark that if, from a few days' rain, the consumptives under my care were confined to their houses, instead of being able to take the daily out-door breathing always prescribed, the aggrevation of symptoms was always marked and universal. The appetite fell off, the debility became greater, the mind was less buoyant, the local mischief increased." Better go out with respirators and mufflers, under ordinary circumstances, than stay in. A muffler, which a patient may make for a few pence, being as good as any expensive respirator. This is made out of a piece of fine wire gauze, cut oval, so as to cover the mouth and nose, and fixed in the centre of a handkerchief, so that it may be tied on like an ordinary comforter, with the gauze in the centre, for breathing through.

The want of pure air is thought to be an objection to hospitals for consumption. Dr. Richardson admits "that a vast deal of good is, or may be, done at these institutions by the treatment prescribed by the physicians who attend at them, and whose lives are devoted to the study of the disease, there cannot be a doubt. But that it is either physiological, or sound practical treatment, to receive into these buildings consumptive patients, is an assumption I most earnestly dispute. I know the excellent spirit in which institutions of this kind are founded. I am fully aware of the care that is bestowed on the inmates; of the attempts that are made to introduce every hygienic improvement; of the order and cleanliness that prevail; of the kindness of the attendants; of the excellence of the diet-rule; and of the skill of the physicians.

"With all this, it is to me as clear as crystal, that to bring phthisical patients into such institutions is a great charitable mistake. The very care, and waiting-servant attention, that is paid to such of the invalids as are in the first and second stages of the disease, is a cruel kindness. The remedy for them is to encourage and urge them to assist themselves and to exert themselves. Moreover, no kind of hygienic system, carried on in a large building filled with inmates, can make the air of that building in any way equal to the outer air, which it is so necessary that the consumptive person should breathe. Twenty patients, lying in one hospital ward, will throw off per minute into the air of the ward at least three and a half cubic feet of expired and impure gases, rendered in the phthisical the more impure by the pathological condition of the lungs. But the impure air thus exhaled vitiates by its diffusion twenty times its own volume of pure air; so, that, in fact, in a ward with twenty patients, there are not less than seventy cubic feet of air spoiled per minute, and rendered unfit for the purposes of life. It may be granted that during the day, when the wards are less full, and many windows are open, and the movements of the inmates are active, the expired air may be fairly disposed of. But take a winter night of twelve hours; consider that in this period of time the twenty patients would, if they exhaled even naturally, vitiate fifty thousand four hundred cubic feet of air, which ought to be removed, and to be replaced by two thousand five hundred and twenty cubic feet of *pure* air for the use of respiration; and then reflect whether it is probable that such a ward can remain during the whole night uncontaminated. For, granting to the twenty patients a breathing-space of twenty-six thousand cubic feet, and even then it would require that the whole of the air in that space should be removed and replaced by fresh air fully twice in the one night. Against this, possibly, the artificial ventilating argumentists will urge that such a feat of ventilation is nothing at all, not worth considering, so easy to be done. M. Grouvelle would probably undertake to effect such interchange eight times in the night, or more; and if he undertook to do it eighty times, and did not succeed in doing it once, it might be difficult to prove the fact against him. But if he would take a strip of paper prepared for ozone, place it in a ward, however artificially ventilated, and place another similar paper in the open air adjoining the ward, it is a mistake if he should not find that there was a striking difference in the process of oxidation in the two localities; and that the great life supporter, oxygen, was in a condition to play a very much more active part in its outdoor than in its indoor work.

"The misfortune of a great hospital, with all its rooms communicating indirectly with each other, is, that the ventilation is always uncertain. There is, in fact, no properly ventilated space except the great vault of heaven, and no true ventilating power except in the combinations of atmospheric pressure, wind movements, and the force of diffusion.

"If special hospitals for consumptives are to be had, they should be as little colonies, situated far away from the thickly populated abodes of men, and so arranged that each patient should have a distinct dwelling-place for himself. They should be provided with pleasure-grounds of great extent, in which the patients who could walk about should pass every possible hour in the day; and with glass-covered walks overhead, where they could breathe open air, and yet be dry, even if rain were falling. Very expensive such an establishment would be, there is no doubt; but it would, I take it, be infinitely more practically advantageous to treat ten patients in this manner, than ten tens in a confined brick-and-mortar box, through which of necessity some amount of invisible impurity, some trace of transparent poison-cloud, is constantly floating.

"The strongest argument in favor of consumption hospitals, is, that they receive those members of the community who could not at their own homes afford the same advantages as are supplied to them in the charity. Against this it is to be urged that the patients taken into the consumption hospitals are *not*, in this country at least, in any way to be considered as the representatives of the most needy and destitute sections of the community. These latter go to their last homes in the workhouses, or in their own poverty-stricken dwellings. The classes that fill the hospitals are often many grades above destitution; and are sometimes comparatively wealthy. They have access to a governor, who gives them an admission-letter, and they leave their own medical adviser to enter the hospital, not because they cannot find the means to live at home and be treated at home, but because, catching at every new suggestion offered to them, they set their hearts on getting into the hospital, as though it was a certain haven of rescue. In this scramble after admission some of course succeed; they leave their homes, they enter the hospital, and there the greater proportion of them either die or return back to their friends nearer death than before. A few recover or are relieved; but whether the same result would have occurred, if they had been subjected to the same medical and general treatment out of the hospital—is a question which may be left very safely answered in the affirmative."

Rule 2.—*Active exercise is an essential element in the treatment of consumption.*

Next to a free exposure to air, Dr. Richardson agrees with Drs. Rush, Jackson, and Parrish, in thinking that vigorous exercise is by far the most efficient remedy in the treatment of consumption. "Walking," he says, "is the true natural exercise, and the best, for it brings into movement every part of the body more or less, and, leading to brisker circulation in every part, causes a more active nutrition generally. The extent to which exercise should be carried will vary with the stage of the disease, and temporary accidents may for the moment stop it altogether, such, for instance, as an attack of hæmoptysis. But when exercise is advisable, the general rule is to recommend that it be carried out systematically, cautiously, and courageously, and that each exercise should be continued until a gentle feeling of fatigue is felt through the whole muscular system. Violent and unequal exertion of the upper muscles of the body is unadvisable. When restored from the fatigue of one exertion, another should be undertaken, and during the day this cannot be too often repeated. If the day be wet, then the exercise should be effected by walking in a large room, or by engaging in some game, such as skittles, billiards, or tennis.

If, in his waking hours, the consumptive patient can keep himself occupied pretty freely in muscular labor, he secures the best sudorific for his sleeping hours that can possibly be supplied; for as the cause of force is always expended in producing motion or action, so, to use the words of Dr. Metcalf, 'the proximate cause of sleep is an expenditure of the substance and vital energy of the brain, nerves, and voluntary muscles, beyond what they receive when awake; and the specific office of sleep is the restoration of what has been wasted by exercise.' Cough is very much less frequent in the course of the night in him who has been subjected to exercise in the day; while sleep, when it falls, is more profound, and more refreshing.

"In summer time, when the temperature of the day is high, the morning and the evening time are the best adapted for the periods of outdoor exertion. In the other seasons, mid-day is preferable, as a general rule.

"I have sometimes been asked whether what are called gymnastic exercises are commendable in consumptive cases, and whether swinging is good. My idea on these points is that, in swinging, a person is much more usefully exercised when throwing the swing for his associates' pleasure, than in being himself swung. There is, in fact, but little faith to be placed in so-called scientific gymnastics. Anything that a man invents to overtop or compete with nature must need be paltry. Brisk natural movement of the limbs is all that the consumptive requires. He need not go out of his way after a sham, in the shape of shampooer; chopping wood is a good gymnastic feat, and playing at skittles is perfect in its way.

"The value of exercise is threefold. First, it checks waste of muscular structures, for muscles left inactive undergo a consumption, without any necessity for lung disorder. Secondly, it diverts the blood from the lungs, causes a more brisk circulation through them, and a more free distribution through the system at large. Thirdly, it induces a more free respiration; more oxygen is taken into the lungs, the body is restored to its vital purposes more surely, and, just in proportion as this restoration is effected, so is the restoration of disordered function and of disorganized tissue.

"In the performance of muscular exercise let the consumptive never encumber himself, or check the free movements of his body by strappings, loads of clothes, or carrying of weights, and the like. These are but tasks; they lead to unequal exertion in special sets of muscles, and such inequality of expenditure is that which is to be avoided. The treatment of consumption in an hospital is objectionable, again, in regard to exercise. Of what use to the consumptive is an acre or two of airing-ground confined at the back of his hospital? Let him be certain that where the gardener cannot make roses bloom, and peach trees blossom, no doctor can give to the anæmic cheek a permanent color, to a lost function its uses, or to an impoverished body its once healthy power.

"A last consideration on the value of muscular exercise is, that it is eminently useful in keeping the respiratory muscles in a state of active nutrition. For, if to the loss of capaciousness in the lungs to receive air, there is added a daily increasing failure in the muscles by which the acts of inspiration and expiration are carried on, it is clear that a double evil is at work. Now this double evil is most actively presented in consumption. As the respiratory muscles, together with the other muscles, lose their tone, so do the general symptoms of exhaustion increase in severity; sometimes without very marked change in the pathological condition of the lungs. As a sequence, day by day, as the nutrition of these muscles decreases, and as they fail in tonic contractile power, they gain in excitability; so that the irregular spasmodic contractions to which they are subjected in the act of coughing are produced by the merest excitement, and the cough is more frequent as it becomes more feeble."

Rule 3.—*A uniform climate is an important element in the treatment of consumptives.*

No particular place is recommended for consumptives, but here is the formula for an hypothetical consumptive Atalantis. "It should be near the sea-coast, and sheltered from northly winds; the soil should be dry; the drinking water pure; the mean temperature about 60°, with a range of not more than ten or fifteen degrees on either side. It is not easy to fix any degree of humidity; but extremes of dryness or of moisture are alike injurious. It is of importance in selecting a locality that the scenery should be enticing, so that the patient may be more encouraged to spend his time out of doors in walking or riding exercise, and a town where the residences are isolated and scattered about, and where drainage and cleanliness are attended to, is much preferable to one where the houses are closely packed, however small its population may be."

Rule 4.—*The dress of the consumptive patient should be adapted to equalize the temperature of the body.*

Rule 5.—*The hours of rest of the consumptive patient should extend from sunset to sunrise.*

This rule, in Dr. Richardson's opinion, is imperative for many reasons. "First, because in all seasons the actual amount of rest required by the natural man is pointed out with the precision of an astronomical law by the course of the sun. In midwinter men require, for physiological reasons, more sleep than they do at midsummer, and just so much more as is indicated by the difference of night in these two periods. Observe how all animals, left to their own natural instincts, obey this law. Secondly, in our present artificial mode of life, we have to extend the day by the invention of artificial lights. But whenever a man shuts himself up in his closet, and makes a little sun out of his gas-lamp or candle, he is feeding that lamp with part of his own breathing store—the air around him. Worse still, the candle can, no more than the man, live alight without exhaling carbonic acid gas, and thus vitiating the atmosphere. A pound of oil burnt in a lamp produces, in burning, nearly three pounds; and every cubic foot of coal gas, rather more than a cubic foot of carbonic acid. The evil effects of carbonic acid on the lungs have been already described. Thirdly, as an artificial light is, by the mode in which it is produced, of necessity injurious, so, on the contrary, the pure sunlight is of the greatest worth in the acts of vitality. What sunlight does in a physiological way is undetermined; but its general influence has long been known and recognized. Plants banked up from light become blanched, and human beings kept for a long time in dark abodes become the victims of anæmia and scrofula.

"Thus, to fulfil the natural law regulating the times of sleep, to escape from the artificial light, and to obtain the advantage of all the sunlight that can be secured, the consumptive patient should make the snn his fellow workman." Bnt is not this going a little too far? Mnst the consnmptive patient remain eighteen honrs in bed in the shortest days of the year, and keep ont of bed for the same period in the longest days? and ought the valetndinarian Laplander to remain in bed dnring his long winter, and to keep up thronghout the entire summer? Snrely not; and yet, upon this principle, he ought to have no alternative.

RULE 6.—*The occupation of the consumptive patient snould be suspended if it is indoor or sedentary; but a certain amount of outdoor occupation may be advantageous.*

Among other remarks which naturally arise when speaking upon a rule such as this, is one which deserves considerable attention. It is this: "In the case of parents having children of a consumptive tendency, therefore, the greatest care should be taken to obtain for them ontdoor employment. But here a serious delusion comes into play. If the child is weakly, the fond parent urges, that it is unfit for hard labor and for outdoor vicissitndes; so it is sent to a tailor or shoemaker, to a clerk's office, a draper's shop, or to some occupation of an indoor character; by this grand, ignorant, and fatal mistake, it is added to the list of the two-thirds who swell the tables of consumption cases."

RULE 7.—*Cleanliness of body is a special point in the treatment of consumption.*

RULE 8.—*Marriage of consumptive females for the sake of arresting the course of the disease by pregnancy is morally wrong, and physically mischievous.*

RULE 9.—*The diet of consumptive patients should be ample, and should contain a larger proportion of the respiratory elements of food than is required in health.*

RULE 10.—*The medicinal treatment of consumption should in the main be of the tonic class.*

There is no doubt, as Dr. Richardson says, that the public expect to be cnred by pills and plasters, and not by a series of instrnctions tending to bring men into obedience with the laws of natnre, and therefore much credit is due to him for constructing this sanitary decalogne, even though subsequent inquiry may lead him to modify some of its articles.

ART. V.—*On the Surgical Anatomy of the Brachial Artery:* By M. S. BUCHANAN, M. D., Lecturer on Anatomy, Anderson's University.

THERE is no situation in the body which has been so frequently the subject of surgical operation, as the bend of the arm. From the earliest times, and in all countries, phlebotomy has been here practised. Gardeners, barbers, and blacksmiths have been more frequently the operators than the well-educated surgeon, and lancets of every size, shape, and quality have been the instruments employed. When such has been the state of matters, need we be astonished at the consequences resulting from this operation, simple though it be, or at the lamentable injuries inflicted by such daring? Sangrado was a paragon of knowledge and dexterity when contrasted with the bodily or mental powers exhibited by the classes above alluded to, who, till a late period, in many of our country parishes, monopolised this branch of operative surgery.

Why this particular part of the body was selected for this operation, in the early periods of the art, or why, in later times, surgeons still persist in invariably making choice of the median basilic vein, as the only one in the body from which venous blood is to be obtained, I have been at a loss to understand. The young student must have remarked in his dissection of this part, how variable is this vessel, both as to size, position, and relations, and how dangerously situated over the semilunar fascia of the biceps muscle, and overlaying the brachial artery. The great diversity also of adipose tissue, so frequently found deposited between the cutis vera and this vein, more especially in females, renders this situation the most hazardous in the body for the performance of this operation. Two inches below the bend of the arm, the subcutaneous radial, ulnar and median veins will be found nearly as large as the median basilic, and separated from their respective arteries at so great a distance, as to render it impossible, even for the most ignorant or daring, in making choice of any of them for phlebotomy, to do any serious injury.

'Tis fortunate that fashion has made a great change in the treatment of diseases by phlebotomy of late years, substituting other equally efficient and more safe remedies. Well do I recollect, not many years ago, of the bloody scenes exhibited in the waiting room of our Infirmary on Sundays, where patients, by the dozen, were petitioners to the attending surgeons for this operation, which, in their estimation, was the panacea for all diseases; and too frequently were their wishes complied with, in order to give the pupils in attendance an opportunity of showing their dexterity. In private practice also, the time is not distant, when, if there was no symptoms to contra-indicate its performance, this operation was without fail had recourse to, once, twice, or thrice, as a fine specimen of what was then designated active or energetic practice. Lancet cases, containing from six to twelve instruments, were constantly carried by every medical man, whether physician or surgeon, and a relay was generally in the hands of the instrument-maker, preparing to take the place of those unfitted for service. What a splendid caricature might not a Hogarth or a Cruickshanks have made of the surgical leech of those bygone times! A fat wife is attacked with pleurisy, and calls in the aid of a young surgeon, who advises phlebotomy, and, in the presence of some of the patient's friends, proceeds to bandage the arm in the usual way, in order to start the veins; he rubs the fore-arm towards the bandage, but alas! no vein becomes visible, in his anxiety, he thinks he feels something very like it, he plunges his lancet where it ought to be, but instead of blood, nothing but fat fills up the wound made by his instrument; ashamed at his blundering, and blushing at his want of dexterity, he is determined now not to be beat; he rubs vigorously the hand and fore-arm, and with redoubled courage and firm grasp, he plunges his lancet through the protruding fat, deep into the subjacent parts, when, instead of venous blood, a stream of vermillion-colored fluid darts into his face, and proclaims to the bystanders that the brachial artery has been punctured, and the life of the patient endangered. From what has been above stated, it must be evident that wounds of the brachial artery, either by the side of the median basilic vein, or by its being tranfixed, have been by no means unfrequent; and thus we find Mr. Harrison, in his excellent monograph on the surgical anatomy of the blood vessels, arranging the injuries of the artery under four divisions:

1. Circumscribed aneurism, in which the pouch communicating with the wounded artery is small and well defined.

2. Diffuse aneurism, where the disease extends along the line of the artery from the injured spot towards the axilla.

3. Aneurismal varix, in which adhesion of the posterior wall of the transfixed vein to the anterior wound of the artery, allows a free jet of arterial blood to pass from the one into the other.

4. Varicose aneurism, where the transfixed vein communicates indirectly with the wounded artery by means of a cyst of variable size, the result of adhesive inflammation.

There is no question in surgical anatomy more important than the treatment of the above injuries, none where the opinions of authors are so varied, and no one which demands a more careful revision. In no part of the vascular system is the anastomosis more free than around the elbow joint. The recurrent branches of the radial, ulnar and interosseous arteries, meet so directly those of the superior and inferior profunda and anastomotica magna, that even the usual coarse injection used in the dissecting-room, is frequently found to pass from the one series of vessels to the other. Such being the case, one would imagine that if the brachial artery were wounded at the bend of the arm, the principle now so unanimously adopted in the case of wounded arteries, in every part of the body, of the application of a ligature on each side of the injured spot, would be here rigidly adopted; yet, strange as it may appear, this important surgical axiom has been set at nought by some of the most talented of our own country, as well as by those on the continent. Dr. Colles of Dublin thus expresses himself: "I have repeatedly operated, and with success, for the cure of circumscribed brachial aneurism, in consequence of injury to the artery in performing venesection. I have frequently also assisted others in operating for the same cause, and with the same result; and I have never yet found it necessary to open the aneurismal sac to look for the vessel below the tumor, or to apply more than one ligature around the artery, and which I think ought to be tied as near as possible to the seat of the disease." "Again," he adds, "I have known several cases of this species of aneurism, and from the same cause in young persons, in whom a perfect recovery was accomplished by the application of gentle pressure on the parts, by bandaging the fingers, hands, and fore-arm, by rest and constitutional treatment. I should therefore recommend, in almost every recent case of this injury, a trial of this practice, before having recourse to an operation." Mr. Harrison also, in the work formerly alluded to, remarks in a foot-note at page 184: "Were a surgeon present at or immediately after the occurrence of such an accident as wound of the brachial artery in venesection, should he at once extend the wound so as to expose the artery, and tie it both above and below the opening, or should he close the external wound, and attempt the cure by compression? I do not," he adds, "consider this question to be decidedly settled, even at the present day; my own experience," he concludes, "would incline me to give a fair trial to the latter practice." Now, without adverting to the cases of unsuccessful treatment of wound of the brachial artery by compression, which I have seen in the wards of our hospital, or to those treated by my colleagues, I would put the question to both Dr. Colles and Mr. Harrison, what would be their practice in a case of punctured wound with a penknife, of the radial or ulnar arteries at the lower third of the fore-arm, or of the brachial artery at the middle third of the arm? The answer would be, unhesitatingly, apply a ligature on both sides of the spot injured, to prevent collateral circulation, and thus secure the patient against the risk of secondary hæmorrhage.

Then why make an exception to this important principle, because the wound at the bend of the arm has been inflicted with a lancet, and in a part far more liable to secondary hæmorrhage than any of the others above adverted to? I may be told that in some cases success has followed the plan by compression, or by the application of the single ligature on the heart side of the injury. I answer, look to the formidable catalogue of aneurisms enumerated in the first part of this paper, as the result of this vacillating practice. Again, it has been affirmed that an exception must be made to the application of the double ligature on each side of the wounded artery at the bend of the arm, in consequence of the venous plexus which is so frequently found here. My reply is, that he would be a sad specimen of professional timidity and incapacity, who would have respect for such veins as the median cephalic or basilic, when the brachial artery has been wounded; besides, the most slender knowledge of anatomy should demonstrate, that with very little dissection, either of those veins, in such a case, could be turned aside, and the wounded artery thus secured above and below the injured spot. 'Tis the great misfortune in all such cases of wounded artery in phlebotomy, that the person who has been the culprit is always anxious to conceal his blunder; he is the last man who should be allowed to perform the delicate operation of securing the injured vessel; he is, for the moment, the advocate of the palliative plan by compression; he bandages the arm firmly with the vain hope that his *faux pas* shall pass undiscovered, and it is only after some days or weeks, when the dire consequences of bandaging are disclosed, that some more experienced surgeon is consulted. Whereas, had the nature of the injury been divulged at the moment, and a consultation called on the case, certain I am that the unanimous decision would be, apply a ligature on each side of the lancet puncture, as near as possible to the injury. Mr. Guthrie, in his admirable treatise on the diseases and injuries of arteries, has the following case in point: "A poor man had the artery opened at the bend of the arm in bleeding, and the operator suspecting the injury he had committed, applied a compress and bandage to restrain the hæmorrhage, which, nevertheless, recurred several times, on which he was sent to the hospital with the arm now inflamed, swelled, and injected with blood. The brachial artery was tied close to the wounded part, but as the bleeding returned, it was again secured higher up; hæmorrhage again took place, amputation was had recourse to, and the patient died exhausted." On dissection, it was found that the brachial artery was the vessel injured, nearly at its bifurcation; and Mr. G. adds in his own clear and decided way, in such a case three ligatures would have been required, one on the main trunk, and one on its radial and ulnar branches. Even Mr. Harrison himself allows that, in almost every case of diffused aneurism, the result of injury in venesection, search must be made for the wounded vessel, and a ligature applied; but he adds most candidly, in many cases of this nature, amputation must be had recourse to.

In conclusion, I would ask, why all this indecision, why this confusion of practice, but from a disregard of the great principle applicable to injured arteries in every part of the body, whether covered by muscles, or complicated with veins or nerves; of enlarging the wound over the vessel, and securing it above and below the injured spot? Of one thing I feel certain, had the above simple rule been rigidly adhered to in all cases of wounds of the brachial artery at the bend of the arm, many aneurisms would have been prevented, some limbs saved, and not a few valuable lives preserved.—*The Glasgow Med. Jour., April,* 1857.

ART. VI.—*Inflammatory Affections, and their treatment by Bloodletting and Antiphlogistis.*

Reflections on the results of experience as to the symptoms of Internal Inflammation, and the effects of Bloodletting during the last forty years: By W. P. ALISON, M. D., D. C. L., Emeritus Professor of Practice of Medicine, Edinburgh. ('Edin. Med. Journal.' March, 1856.)

Observations on the results of an advanced diagnosis and pathology applied to the management of Internal Inflammations, compared with the effects of a former antiphlogistic treatment, and especially of Bloodletting · By J. HUGHES BENNETT, Professor of the Institutes of Medicine and of Clinical Medicine in the University of Edinburgh. ('Edin. Med. Jour,' March, 1857.)

Reply to Dr. Bennett's Observations on the results of an advanced diagnosis and pathology in the management of Internal Inflammations: By W. P. ALISON, M. D., Emeritus Professor of Medicine, Edinburgh. ('Edin. Med. Jour.,' May, 1857.)

A Reply to the preceeding paper of Dr. Alison: By J. HUGHES BENNETT, M. D. ('Edin. Med. Jour.,' May, 1857.

THE Medical and Chirurgical Society of Edinburgh has recently been the scene of a *passage d'armes* between Dr. Alison and Dr. J. Hughes Bennett, upon the change which has taken place in the treatment of inflammatory affections. It is admitted by both combatants that the practice of bleeding in acute inflammations has, within a recent period, undergone a great change—that, whereas formerly it was the rule to bleed promptly, largely, and repeatedly, that now such bleeding is rarely practised and rarely necessary. According to Dr. Alison, antiphlogistic remedies, and more especially bloodletting, were formerly highly successful in arresting the disease, whereas now they are actually injurious; and the inference he draws is, that inflammation itself is no longer the same—that its type, and more especially the febrile symptoms accompanying the inflammation, have altered from an inflammatory to a typhoid type, and that the practice has very properly changed accordingly. According to Dr. Bennett, on the contrary, this great revolution in treatment is the natural consequence of an advarced knowledge in diagnosis and pathology. In the first place, Dr. Bennett thinks that little reliance can be placed on the experience of those who, like Cullen and Gregory, were unacquainted with the nature of internal inflammations and the mode of detecting them. In the second place, he thinks that inflammation is the same now as it ever has been, and that the analogy sought to be established between it and the varying types of fever is fallacious. In Dr. Bennett's opinion, moreover, the principles on which bloodletting and antiphlogistic remedies have hitherto been practised are opposed to a sound pathology. How these principles are thus opposed will appear in what is said upon the natural progress of inflammation.

"If" says Dr. Bennet, "we watch the natural progress of inflammation in any of the textures of the body, we observe that it terminates in two ways, 1st., by vital changes of growth of different kinds in the exudation, constituting what has hitherto been called suppuration, adhesion, granulation, cicatrization, the healing processes, etc., etc., and, 2dly, by death of the exudation, which, if rapid, putrefies, producing gangrene, or, if slow, disintegrates, causing ulceration. The first series of changes are not destructive, but formative and reparative. Suppuration especially should be looked upon as a kind of growth, which enables the exuded and coagulate blood-plasma to be rapidly broken up, and eliminated from the economy. If so, instead of being checked, it should be encouraged as much as possible; a very different doctrine from what has hitherto prevailed. Again, everything that lowers the vital strength and weakens the economy, must impede the nutritive processes of growth, and tend more or less to a slow or rapid death of the exudation. Bloodletting, especially, has this tendency, and must, therefore, be wholly opposed to the rapid disappearance of inflammation; for example:

"If a bone be fractured, inflammation occurs around the injured part, and exudation is poured out, which undergoes vital changes, whereby ultimately it is transformed into bone. If soft parts are destroyed or removed, the exudation poured out from the injured vessels undergoes other vital changes, whereby it is transformed into fibrous tissue, constituting, first granulations, and then a cicatrix. After subcutaneous section of tendon, with separation of its extremities, the transformation is more perfect, producing, as in the case of bone, a growth exactly similar to the one which was injured. If a violent blow or injury has been received, a greater or less amount of exudation is infiltrated among the contused and torn tissues, which is transformed by cell-growth into pus, which, if it can be evacuated externally, is soon got rid of, but if not, is on the disintegration of the cell absorbed and excreted from the economy. If, under other circumstances, the pus is absorbed as rapidly as it is formed, the inflammatory swelling is said to be resolved or discussed; if not, it collects in the form of a fluid to constitute an abscess. Surely it cannot be maintained that, in any of these cases, we can favor these reparative processes by bloodletting and lowering the strength of the economy. On the contrary, they have always been found to be best perfected in individuals of vigorous constitutions, whilst in scrofulous or broken-down and weak persons, they proceed slowly or not at all.

"But in internal inflammations, say of the lungs or pericardium, are the processes different? Certainly not. In the one case the exudation is converted into pus-cells and absorbed, and in the other into fibrous texture, causing adhesions. But because these processes have been hid from view, physicians have supposed that, instead of treating the inflamed parts as the surgeon does, he ought to attack the general symptoms which result from the lesion. In cases of fracture and contusion, there are also febrile symptoms, increased pulse, and so on. But does the surgeon imagine that callus will form better, or his abscess be resolved, or reach maturity sooner, by general blood-letting and antiphlogistics? Experience teaches him otherwise, and in the same manner it is certain that such treatment does not favor the natural termination of internal inflammations.

"It may be well, however, in further proof of this, to point out a little more particularly what are the changes which a pneumonia and a pericarditis do go through, as illustrative of the proposition we seek to establish.

"In pneumonia the exudation is infiltrated into the air-vesicles and minute bronchi, and between the fibres, bloodvessels, and nerves of the parenchyma, imprisoning the whole in a soft mass, which coagulates and renders the spongy texture of the lung more dense and heavy, or what is called hepatized. This accomplished, no air can enter, the circulation in the part is arrested and the nerves compressed, and the object of nature is now to reconvert the solid exudation once again into a fluid, whereby it can be partly evacuated from the bronchi, but principally reäbsorbed into the blood, and excreted from the economy. This is accomplished by cell-growth. In the amorphous coagulated exudation, granules are formed, around groups of these cell-walls are produced, and gradually the solid amorphous mass is converted into a fluid crowded with cells. This is pus. The cells, after passing through their natural life, die and break down, whereby the exudation is again reduced to a condition susceptible of absorption through the vascular walls, and once again mingles with the blood, but in an altered chemical condition. In the blood, the changed exudation (now called fibrin) undergoes further chemical metamorphoses, whereby, according to Liebig, it is converted, by means of oxygen, into urate of ammonia, choleic acid, sulphur, phosphorus, and phosphate of lime. The urate of ammonia, by the further action of oxygen, is converted into urea and carbonic acid; the choleic acid into carbonic acid and carbonate of ammonia; the sulphur and phosphorus into sulphuric and phosphoric acids, which, combining with an alkali earth, form sulphates and phosphates. If it should happen that the quantity of oxygen taken is not sufficient completely to accomplish this cycle of changes, then, instead of urea, either urate of ammonia appears in the urine, or if the ammonia have entered into any other combinations, pure crystals of uric acid or fibrin. In consequence of these or similar changes, the exudation is finally removed from the economy.

"In a pleurisy or a pericarditis, the transformations occurring in the exudation are different. Let us follow them in the case of pericarditis, as we have carefully described them in pleuritis in another place. When a severe inflammation of the pericardium occurs, the liquor sanguinis is exuded in considerable quantity, separating the serous layers to a greater or less extent. After a time the fibrin coagulates and forms a layer which attaches itself to the membrane, whilst the serum of the blood accumulates in the centre. The coagulated fibrin at first assumes the form of molecular fibres, plastic or pyoid cells are formed in it; others throw out prolongations, so as by their union to form a plexus, which, communicating with the vessels below the serous membrane, renders the exudation vascular. Gradually the surface assumes the appearance of a villous membrane, as well as the absorbent functions of one. The enlarged villi frequently contain vacuoles or spaces, reminding me strongly of the placental tufts, than which nothing can be imagined more perfectly adapted for the purposes of absorption. In consequence, the serum now disappears, the two false membranes are brought into contact, and thus absorption, as soon as it is no longer required, is put an end to, and adhesion occurs. The matters absorbed into the blood pass through the same series of changes as those in pneumonia do, and are eliminated from the economy in a similar manner. Such is the natural progress of pericarditis.

"The two kinds of processes now described exhibit the same wise design in pathological as we everywhere find in physiological actions. In the vascular tissue of the lung, new blood vessels are unnecessary. But in the non-vascular serous membrane, they must be formed to bring about removal of the morbid products. In the one case the entire exudation is transformed into cells, to produce rapid disintegration and absorption, which latter is easily accomplished by the already formed numerous vessels of the lung. In the other case, the exuded liquor sanguinis is separated into solid and fluid parts, and as there are no vessels in the serous membrane, they are formed in one portion of the exudation to cause absorption of the other.

"During the progress of these essentially vital acts and modes of growth and formation, how can it be supposed that lowering the strength by bloodletting, can influence them in any way except for the worse; that is to say, weakening that power on which the transformations depend?"

In the last place, Dr. Bennett attempts to show that all positive knowledge of the experience of the past, as well as the more exact observations of the present day, alike establish the soundness of his position. The history of pneumonia is appealed to, and the answer appears to be very conclusive. At any rate, Dr. Alison allows it to pass unchallenged. Appealing to this history, then, it would appear that the result of a vigorous antiphlogistic treatment of pneumonia, as formerly practised in the Edinburgh Infirmary, in the Hôpital la Charité, at Paris, and elsewhere, is a mortality of 1 in 3 cases; that the result of a treatment by tartar emetic in large doses, as practised by Rasori, and more recently by Dietl, is a mortality of 1 in 5 cases, or, according to Laennec, of 1 in 10; that the result of moderate bleedings, as in the treatment of Grisolle, is a mortality of 1 in 6½ cases; and that the result of a dietetic treatment, with occasional bleedings and emetics in severe cases, as with Skoda, is a mortality of 1 in 7, and if pure, as under Dietl, a mortality of 1 in 13. These are data derived from the experience of large public hospitals. Dr. Bennett also shows that the mortality from pneumonia in the army and navy, where the malady has arisen for the most part in healthy able-bodied men, is also 1 in 13. And, lastly, Dr. Bennett shows that the result of his own practice at the Edinburgh Royal Infirmary, during the last eight years, has been to reduce the mortality still further, namely to 1 in 21⅔ cases, or to $\frac{1}{7}$ only of the numbers of twenty years ago. In this practice no attempt is made to cut the disease short, or to weaken the pulse and vital powers; but, on the contrary, the aim is to further the necessary changes which the exudation must undergo in order to be fully excreted from the economy. To this end salines are given in small doses, during the period of febrile excitement, with a view of diminishing the viscosity of the blood. As soon as the pulse becomes soft, good beef-tea and nutriments are ordered; and if there be weakness, from four to six ounces of wine daily. As the period of crisis approaches the excretion of urates is favored by giving, three times a day, a diuretic, consisting generally of half a drachm of nitric ether, sometimes combined with ten minims of colchicum wine; but if the crisis occurs by sweat or stool, no care is taken to check it in any way.

The question, no doubt, is one of considerable difficulty, and much remains to be proved before it can be finally disposed of, but at the same time we do not hesitate to say that our sympathies, both in pathology and practice, are with Dr. Bennett rather than with Dr. Alison. At any rate, we cannot allow that Dr. Alison has advanced sufficient evidence to show—and this is the great point of his argument—that bleeding and other severe antiphlogistic measures have ceased to be necessary because inflammation itself has become more asthenic than it was formerly.—*Abstract Med. Sci., July*, 1857.

ART. VII.—*Medicinal and Surgical Uses of the Perchloride of Iron.*

IN the sitting of the Academy of Sciences on the 29th of June, 1857, M. Deleau read a memoir on the *use of the perchloride of iron in diseases;* of which the following paper is a summary translated from the report in *L'Union Médicale* of July 11th, a valuable exchange of the *N. O. Med. and Surg. Jour.*

The hæmostatic properties of the perchloride of iron, I have turned to account in hæmorrhages in general, agreeably to the experiences of M. Pravaz, from which I have been insensibly led on to its use from uterine hæmorrhages to leucorrhœa, thence to blennorrhagiás, chancres, ulcerations of the vagina, and scrofulous affections. After having experimented with the perchloride of iron for two years in my infirmary at Roquette, which contains 80 beds, where every variety of disease has been admitted, I am enabled to draw the conclusions which follow: 1. The perchloride of iron used internally and externally is free from danger. 2. The perchloride of iron is the most powerful hæmostatic known. 3. It is not only a modifier of the living tissues, but acts on the enteric mucous tissue as a therapeutic agent, as in blennorrhagia, leucorrhœa, bronchial catarrh, etc. 4. The perchloride of iron is an anti-syphilitic, seeing that it cures venereal chancres, ulcerations of the vagina and of the uterus, without producing the manifest and fearful dangers caused by the nitrate of silver, and the preparations of mercury and iodine. 5. The perchloride of iron is a medicine of great potency (*grande puissance médicatrice*) in scrofulous affections.

On the use of Perchloride of Iron as a hæmostatic during operations: By M. Maisonneuve; (*Mon. des Hôpitaux.*)—A correspondent of this journal states that one of the principal elements of success in the difficult and dangerous operations M. Maisonneuve is famous for undertaking, is the remarkable use he makes of hæmostatics during their performance. He cites a recent case, occurring in a lad of sixteen, of fungous tumor of the dura mater, the growth of which, after being temporarily arrested by ligature of the carotid, increased very rapidly, and was accompanied by exhausting hæmorrhages. M. Maisonneuve determined upon its removal, but the tumor bled on the slightest contact, and the patient would not be able to bear the slightest loss of blood. The line of incision extended from the anterior parts of the ear to the summit of the head, and descending along the nose, was carried backwards, and then upwards to the base of the jaw, and its point of departure. A great number of arteries were thus divided, five or six of which, by reason of their anastomotic enlargement, had acquired almost the size of the radial artery. Intelligent assistants immediately compressed them with the finger, but it was impossible to thus continue the dissection without exposing the patient to the danger of death from syncope. M. Maisonneuve therefore applied to each vessel a little pledget of charpie, soaked in perchloride of iron, which was allowed to attach itself to the wound. At every stroke of the bistoury or scissors he applied a new plug, so that during the operation the patient scarcely lost a spoonful of blood; and when the tumor had been entirely removed, the entire surface of the wound was found completely dried and tanned, and was at once dressed, without the necessity of the application of a single ligature. The brown eschar which covered the wound was detached about the twentieth day, without giving rise to any hæmorrhage ; and although the cure can scarcely be expected to prove radical, the patient for the present is perfectly well.—*Ranking's Abs.*

On the use of Perchloride of Iron in Panniform Keratitis. By M. FOLLIN. (*Archiv. Gén. de Méd.*)—The medical profession of Lyons, to whom we are in some measure indebted for the introduction of the use of the perchloride of iron as a therapeutical agent, are much interested just now in its application to the treatment of panniform keratitis. This disease is one of great severity, on account of its tenacity, its relapses, and its incessant aggravations, and finally on account of the impairment or total loss of sight to which it leads. Among the numerous methods which surgeons have employed in its treatment, cauterization and annular division of the vessels supplying the new growth, have doubtless produced successful results ; but their efficacy is not such as to leave nothing more to be desired. Their employment is not always easy, and, in the case of infants, oftentimes impossible.

To destroy the very minute vessels running from the surrounding conjunctiva to the surface of the cornea being the principal indication, M. Follin conceived the idea that this might be accomplished by means of the perchloride of iron. This powerful astringent arrested the abnormal circulation by coagulating the blood in the small vessels, which, consequently, being no longer required, were absorbed, and the cornea regained its transparency. Such are the results obtained by MM. Follin, Broca, and Gosselin, in several cases reported.

M. Follin makes use of the perchloride of iron in a perfectly neutral state, at 30° (Baumé). A single large drop is introduced into the eye by means of a quill. The first effect is a burning pain and a sensation of powerful constriction, which gradually diminish in the course of a quarter of an hour. The heat is, however, more supportable than that produced by many other agents in use, the sulphate of copper for example. If the eye should continue injected and phlogosed, cold applications and gentle astringents should be resorted to ; among which latter M. Follin prefers a decoction of rhatany. The perchloride is not repeated for two or three days, and marked amelioration is generally observed after the third or fourth application ; the vascularity of the cornea is already diminished, the photophobia has nearly disappeared, and the sight made clear. It is rarely necessary, in order to produce a complete cure, to repeat the remedy oftener than ten or twelve times, frequently four or five applications are sufficient.

The presence of superficial ulcers on the cornea does not contraïndicate the employment of the remedy.—*Ibid.*

Treatment of Nævus by the Perchloride of Iron.—The perchloride of iron still holds its place as a very useful agent in the treatment of some forms of nævus. Mr. Lawrence in St. Bartholomew's, and Mr. Cock and Mr. Hilton in Guy's, frequently employ it as at first proposed, by means of injection. Used in this way, its chief advantages are in cases in which the growth is too large to be ligatured or excised. Repeated injections of small quantities at a time appears to be the most successful method, as larger ones risk sloughing. There is a case now in the Middlesex Hospital under the care of Mr. De Morgan, in which a nævus of the middle of the upper lip spread rapidly and ulcerated through the lip, leaving a large fissure. In this, by the use of the perchloride, much advantage has been obtained; the disease does not appear to be spreading. The child's condition is now that of a single harelip, both edges being, however, involved in nævoid structure. Mr. Bowman, in two cases recently under his care, in which the nævus was on the eyelid, has employed the perchloride, introduced by a thick ligature of silk. One of these was that of an infant at the Ophthalmic, on whom we saw him operate the other day. The nævus was about the size of a sixpence, and involved the centre of the upper eyelid, being partly cutaneous and partly under the skin. To have tied it would have involved a subsequent eversion of the lid; and it became a problem of much interest to cure it without leaving a scar. The plan adopted was to draw through its centre two large ligature threads previously soaked in the perchloride. To prevent the threads from being squeezed dry in entering the skin, punctures were made in the latter with the point of a knife, and a broad needle was employed. So complete was the coagulating power of the fluid, that the threads came out quite unstained, and not a drop of blood escaped from the punctures. This having been done, a small actual cautery, about the size of a probe, was introduced into the middle of the nævus, and made to burn subcutaneously a little patch in its centre. The seton threads were to be taken out the same evening. It was hoped that the irritation, etc., which must follow these procedures would destroy the morbid vascularity of the part; and the plan altogether struck us as exceedingly likely to be successful, and at the same time possessing the great advantage of being quite free from risk. Its success it will be for time to determine. With the perchloride, in cases in which the nævus is too large to be safely tied, much patience must be exercised. Many injections will be required, and the shrinking of the vascular tissue will often not be nearly so great at the time as it will become after the lapse of a few months. As exemplifying the dangers of the ligature, we may mention that the writer assisted a fortnight ago in tying a very large nævus on the side of the face in a case in which the infant, healthy at the time, died a week afterwards, and probably from the irritation caused.—*Med. Times and Gazétte, Braithwaite's Retrosp., March* 21, 1857.

Perchloride of Iron in Hemorrhoids.—M. Thierry states that he treats hemorrhoids, even when large, by first blistering them, and then applying the perchloride of iron to the denuded surface, under the influence of which they shrink and disappear. The cure may not be radical, and they may reäppear under the influence of the causes that originally produced them; but this is only the case after a considerable period, and in the meantime health is restored and occupation resumed. M. Thierry employs the same treatment with success in varix.—*Ibid.*

ART. VIII.—*Medical Education.*

THE following extracts are taken from the elaborate Annual Address delivered in May, 1857, before the Medical Society of the State of Pennsylvania, by the learned Dr. R. La Roche, of Philadelphia, President of the Society.

These extracts afford a faint idea of the number, nature, and concentrativeness with which fifty-one large pages can be packed with unpalatable truths. The legal sophism that, the greater the truth, the greater the libel, fortunately, is not a maxim in science. Although "few are so wise as to prefer useful reproof to treacherous praise," yet Dr. La Roche comes forth *pro patria*, disguising nothing, flattering none.

Dr. La Roche says: In this country, as every one knows, we have shown a still greater tendency towards radicalism, so far as regards the organization of the medical profession, as we unfortunately show in most other points connected with the social state. In almost all the colleges of the country, the necessity of a preliminary education is done away with. Indeed, I am not aware, that in any, pains are taken to ascertain whether the aspirant to the honors of the profession can correctly spell the commonest words in the English language and construct the simplest English sentence; while no attention is paid to the nature of his deportment, manners and language. At the same time, in all those institutions throughout the broad extent of the land—and, in this respect, those of the State of Pennsylvania form no exception to the rule—the course of instruction is too limited, the scholastic periods are far too short, and the lectures, in consequence, too crowded together. Sufficient attention is not paid to clinical teaching—I mean hospital clinical teaching; for that adopted in the lecture-rooms of medical schools has little to recommend it, and is open to serious objections. Besides this, the examinations for graduation are too few and of too trivial a character to insure those by whom they are conducted against the commissions of the greatest blunders in regard to the state of preparation of the aspirant, and to enable them to turn out annually a set of young men properly qualified to take charge at once of the sick. It is true, that some professors assert, as I have myself heard them do, that young men, who have passed the ordeal of their examinations, have little more to learn in the branch they teach, and that the same may be said of the results obtained by all the other teachers in the school to which they belong; so that the graduates who issue in shoals from the portals of those institutions, may, one and all, be safely regarded as accomplished physicians and skilful practitioners. On this point, however, we may be permitted, without fear of being accused of undue skepticism, to demur, especially as some, who make the assertion, have been twenty or thirty years in learning what they know, and do not yet know much more than is absolutely necessary; and surely, if such has been the case with teachers, we cannot easily admit the possibility of young men who have gone through a course of instruction such as has been referred to, can so rapidly have acquired the degree of knowledge necessary to entitle them to the favorable opinion thus expressed.

Especially is it impossible for any examiner to ascertain, during one sitting with the candidate, whether the latter has really qualified himself to the extent that is here pretended. One short examination of some ten to twenty minutes on each branch taught, and conducted most generally in private, is not and cannot be sufficient for that purpose. Many must and do pass through the ordeal, who, so far from being accomplished physicians and skilful practitioners, are perfectly unqualified in some of the branches and not much better off in respect to the rest. Of the truth of this there can scarcely be one among us who has not had evidences before his eyes; and surely, when we find some faculties examining between two and three hundred candidates in the short space of a month—somtimes amid the bustle of lectures and of private and public practice, and admitting them all, or nearly all, we cannot but presume, *à priori*, that such must often be the case. Homer himself was at times found napping. The same has been said of many conscientious and venerable confessors, and we must be pardoned for thinking that medical professors are not unfrequently subject to the same fate.

That some of the young doctors so hastily made, do not immediately venture on offering themselves to the public as candidates for professional occupation, but continue for some time longer, either at home or abroad, in prosecuting their studies, may be, and is doubtless true. But the number of those who constitute this better class is comparatively small. More usually the young graduate, fresh from the benches of the school, opens his office and announces his readiness to enter on the practical duties of his calling. It is true, that some of these ultimately become by dint of study and long experience good and safe practitioners. This result, however, is of slow growth, and I hazard nothing in stating that it cannot be obtained otherwise than at the expense of human life. The consequence of these defects in the system of medical education adopted in this country has always been felt among us—not in this State alone, but everywhere. It continues to be so felt to this very day. Perhaps I may go farther and say that it is more keenly felt now than ever before; for the establishment of cheap schools and of free schools in many localities—often in places where the duties of teachers are assumed by men imperfectly qualified for the task, and who would themselves not be the worse off for a proper course of instruction and plenty of reading; and where the appliances for effective teaching, and for clinical instruction particularly, cannot be obtained, has opened the door to many abuses and served to increase and perpetuate the evils to which allusion was made above. In former times, the expenses of travel, added to the high price of medical tuition and medical graduation, deterred many from resorting to distant schools, who otherwise would have selected medicine as their business, though better qualified, from want of early education and mental training, to do justice to some less intellectual or some mechanical pursuit. At the present day, they labor under no such difficulty; for they find near home schools where they can, in a short time and at little or no expense, obtain a regular medical degree. Nay, not a few may take or have taken advantage of the facilities afforded by some schools located even in places where they could least be expected to be found, and which have two sessions and two periods of graduation in the year. Need I say that all these schools are instrumental in enticing into the ranks of the profession a number of individuals who do it no honor and ought to be otherwise employed ; and contribute largely in increasing an evil resulting from an effect which our older and better organized medical establishments proved themselves perfectly adequate to accomplish—namely, spreading over the whole country swarms of half educated physicians?

Let it not be supposed from what precedes, that I am an uncompromising opponent of the establishment of cheap schools. Still less am I adverse to the existence of free schools. But, in order that either set of institutions should deserve the full approbation of the profession, it is necessary that some method should be adopted to insure the selection of proper teachers; that the requirements for admission to the lectures, and more especially to the doctorate, should be of a high order; that the course of medical instruction should be long and complete, and that the examinations should be public, frequent and stringent. When these measures are adopted, such institutions may be entitled to approbation. Until then, they must be viewed as more mischievous than schools conducted agreeably to the ordinary plan. In respect to double session schools, I have no hesitation in remarking that in a country where the doings of medical institutions are concealed from public view, they cannot be otherwise than perfectly objectionable. For though the faculties of such institutions may be occasionally composed of honorable men who will not abuse the privileges of their position, and sell their diplomas too cheaply to young men whose term of instruction has been shorter than is allowed by usage if not by law, yet those faculties have not always been, and may not always be so safely composed, and we all know that from these schools have issued graduates who, so far from having studied the usual time, had done so less than a year. Certainly, such things are intolerable. What has been done at one time may be repeated at some future day, and it becomes imperative on us all to express our disapprobation of the existence of schools where they *may* be done.

A reform in the medical education of this country cannot be too soon effected, and has become a desideratum with every lover of his profession.

As if the course of medical instruction were not, in all conscience, short enough, a plan has been adopted in some large and influential schools which makes it, in some respects, shorter still, and, according to my view of the case, prevents students from reaping to the full extent the advantages they are promised.

The plan heretofore pursued in all the schools of the country was to postpone the examinations of the candidates for graduation, till after the close of the lectures. By this means the student enjoyed, or might if he chose enjoy, the benefit of two courses on each of the branches, of full four months, or four months and a half, according to the institution he selected, without having his mind diverted, during that time, by necessarily dwelling on other considerations than those connected with the subject of the lectures and demonstrations he was attending. When these were over, he had more or less leisure to pass in review the various subjects which had been brought to his attention, and especially to perfect himself on those topics in relation to which he felt himself deficient, besides taking advantage of means of further instruction offered in the way of private lectures and examinations. At present, the examinations in the schools alluded to commence in the early part, and continue during the whole course of the last month of the term. They proceed simultaneously with the lectures, and are there, as in some other establishments, conducted in private and by each professor separately.

Young men are keen enough to discover from the manner in which they have answered questions put to them, and the tone and language of the examiners, whether or not they have been successful. Very few can have, nor, usually, have they, any doubts on the subject. Now, it stands to reason, that as soon as they have passed through the hands of a professor, they will generally at least, neglect the remaining lectures of that professor, or at any rate, will fail to pay particular attention to the concluding portion of his discourse. * * * When they have passed all the examinations they lose interest in the school exercises. The principal object they had in view was to secure the possession of a diploma. They now feel satisfied on that score, and have no disposition to continue their studies. They hence avoid, or lounge about the lecture-rooms and amuse themselves the best way they can till commencement-day, after which, having received, with proper formality and to the sound of music, their long-wished for testimonial, and having, besides, been very gravely told that they are proclaimed, before the large assemblage gathered together to witness the ceremony, "Physicians, not only in name, but in knowlege, Doctors in medicine, to whom the husband may intrust the safety of his beloved wife; the wife, the health of her cherished husband; the parent the lives of his dear children; and the community, the security of those illustrious servants who minister to the glory and safety of the country."

Let us trust that the day is not far distant when the system of private examinations will also be abandoned, and the qualifications of the candidates will be tested, on the several branches taught, in presence of medical commissioners appointed by the governors of the schools or by the society of the States where these schools are located. By expedients such as that mentioned, schools may curry favor with students and enlarge the number of their matriculants, but they do not contribute to the creation of a class of physicians calculated to elevate the character and enhance the honor and respectability of the profession.

Doubtless we labor under more difficulties in this country than is experienced elsewhere, in relation to the attainment of the desirable object to which your attention is now called. They arise from the popular—often radical—nature of our institutions; from the objectionable character and the incompetency of the individuals in whose hands the government of those institutions is very generally placed, or by whom it is monopolized, and from the go-ahead, reckless, unreflective, and presumptive disposition of a large portion of our population, and their ignorance in many matters they undertake to control. From these circumstances there results this fact, that many things are done which affect injuriously the character and interests of the medical profession, and as many are left undone, which that profession would require in order to assume the position to which it has just claims. Raise the cry of the "people;" talk loudly about our "noble republican institutions;" insist upon the vast superiority of these over all other institutions; abuse everything European; especially abuse England and her aristocracy; and enlarge on the liberty which every free-born American citizen possesses of doing as he pleases, and you will be almost sure to obtain from our wise, disinterested and patriotic governing bodies the enactment, within the limits of their influence, of any law however truly objectionable to the well informed and clear-sighted, respecting the organization of our medical institutions, and the rejection, on the score of monopoly, tyranny, and what not, of any clause imposing restrictions on the rapid manufacture of doctors, and on the practice of medicine—in fact, on everything likely to protect and raise the character of the profession. We have, in our endeavors at improvement—in our efforts to promote the interests and secure the rights and liberties—civil, religious, and political—of the "people," succeeded, step by step, rather in placing the higher, or educated classes of the community on a level with the lower, than in elevating the latter to an equality with the former, until at last the natural order of thing has been reversed; power has been assumed by those least qualified to exercise it. In a word, we now find ourselves in the hands of a set from whom little of what is just, wise, useful, or ennobling—nothing indicative of that intelligence, knowledge, and experience which should ever constitute the essential attributes of those who aim at governing their fellow men, can be anticipated. Judging from the results, one would almost imagine that in the selection of their rulers and public servants, our liberty-loving and equality-seeking people frequently follow the system referred to by Figaro: "I was almost in a state of despair. My friends thought of me for an office; but unfortunately I was qualified to fulfil its duties. It was an accountant that was wanted; a dancing master obtained the situation."

But whatever may be the case as regards other matters, certain it is that in all that relates to medicine, such august bodies are not to be trusted. Nothing of a truly useful character can be expected at their hands; while those who control the medical institutions themselves are fettered by influential circumstances which render improvement next to an impossibility. And yet this profession can scarcely hope to attain the high position to which it is entitled, not only so long as the standard of education of its members is not raised; the period of probation of the candidates for the doctorate lengthened, and the plan of examinations improved; but also, so long as proper and efficient measures are not adopted to insure the selection of competent and experienced teachers and the location of schools only where they are needed and can be useful. As matters now stand, any set of medical men, even in out of the way places, where the requisite appliances for imparting instruction are not accessible, may, with some little management and political influence, obtain a charter for a school and start at once on their professional career—no inquiry being made as to their competency, or to their possessing really the right to assume a title which they regard themselves as fit to confer upon others. They may even receive a donation of funds from the State for the purpose of erecting a college building, or for other objects. Depending for the support of their establishment on the number of pupils they can gather, and these, being but too often attracted to an institution by the facilities they there enjoy in hastening the period of their studies, and smoothing their path to the doctorate, those self constituted professors and their successors, are not always as particular as they ought to be as to the nature of the requirements that should be exacted of pupils, and in regard to the results of the examinations to which these are submitted, and, as a consequence, send forth their quota of imperfectly educated physicians.

In many of these institutions, as indeed, in others of older date and higher repute, the selection of the professors is intrusted to boards of governors or trustees, who are irresponsible in their acts. The plan, if those boards were always judiciously composed, could answer a useful purpose. It may be added, also, that on many occasions, they have made very good choices, and I could name faculties selected by such governing bodies which would do honor to any school. But, unfortunately, those bodies are not always composed as properly as might be desirable, considering the duties assigned to them. Hence the choices they make are only occasionally, and accidentally of the satisfactory kind mentioned. In general, they are made up of members of the bar, of clergymen, of merchants, and now and then they contain a sprinkling of physicians—often none at all. The consequences of this arrangement, whenever the members of a body so composed are called upon to make choice of a medical professor, may be easily foreseen. Conscious of their inability to judge, themselves, of the merits of the several candidates, and to select the most competent person to fill a vacancy that may have occurred in the faculty, they are compelled to rely on the opinion of third parties in—often out—of the profession, who, feeling no particular interest in the success of the school, are guided in their advice by their personal regard for a certain applicant, and are, of course, seldom impartial.

Not rarely, the electing body is governed in its choice by family influences and personal considerations, and unheeding the admonitions of better judges, but too often give its preference to inferior men who cannot add to the reputation of the school, but acquiring reputation by being connected with it, tend not unfrequently to lower its character and lessen its influence. * * * The experience of this country teaches us but too well, that in all selections made by a body so composed, politics is a lever more powerfully effective than the appreciation of the merits and fitness of the individual appointed to fill an office; and so far we have had no good reason to presume that a medical appointment left to such hands, will be made agreeably to other principles. In some of the institutions of the country, it may be added, the faculties have the power of nomination.

In no country is the physician surrounded, elbowed, encompassed and interfered with, by one-tenth—nay, one hundredth—part of the quackery and quacks he encounters in our own; and no less in our State than in other parts of the Republic. We have quacks of all kinds, of all colors, of both sexes, of all nations, and quackery presents itself in every form imaginable. Pills, liquids, plasters, oils, embrocations, syrups, elixirs, tinctures of all kinds, even of gridirons—electric oils, electric sugars, balsams, panaceas, float, as it were, around us. We have infallible medicines to be used internally by the stomach; others that are administered by inhalation; others, again, that are applied externally. The number of the inventors, venders, distributors and prescribers of these articles is legion. I shall not occupy your time with a complete enumeration of the different varieties, species, and genera of the quacks by whom our land is polluted—though the statistics of this particular class of natural history would be curious—some pretending that they practice in accordance to what they are pleased to call doctrines of their own; and others, discarding or ignoring all doctrines or theories, and appealing to experience obtained by empirical means—homœopathists, hydropathists, eclectics, steamers, Thompsonians, mesmerisers, electricians, chronothermalists, etc., etc. They start up before us in every direction; reach us from almost every shore of the known world, and, as if the material of which they are formed was not easily enough found in the shape of unemployed and lazy shoemakers, bookbinders, blacksmiths, butchers, ignorant, crack-brained and noisy preachers, and the offices of unprincipled or starving doctors, a foreign sovereign has been kind enough to send us, in the guise of a public functionary—brainless, so far as most matters are concerned, but, as it would seem, expert in the art of curing consumption. These quacks penetrate everywhere, openly or clandestinely. They even find their way into the families, and almost under the very noses of regular physicians.

I should certainly be very unwilling to be understood as stating, even by inference, that quack doctors and secret nostrums are nowhere to be found but in this country. The tribe of the former has existed everywhere and at all times, and are to be found at the present period in every section of the civilized world; while the latter abound wherever the others are encountered. Indeed the love of being gulled would seem to constitute an original attribute of our nature. It has ever betrayed, and to this day betrays itself even in classes of individuals whose intellectual endowments, powers of reasoning, and literary and scientific acquirements, as well as experience of the world, might well have been thought capable of shielding them from its baneful effects.

In Europe none are permitted to practice without a certificate or diploma from some chartered medical school; and while an individual may obtain a patent for a medicine, the composition of that medicine must first be declared to competent judges appointed for that purpose, and whose duty it is to certify as to the safety of its employment and its fitness in the cases for which it is proposed. In England a greater amount of liberty is allowed in both respects; but even there, the safety of the public is cared for to a certain extent, and any overt act, on the part of an unlicensed quack, or in the administration of a secret medicine—especially when the case ends fatally—is usually visited by the application of severe and stringent laws. But neither in England, nor on the continent of Europe, are the members of the medical profession elbowed and circumvented and openly bearded, as it were, by such low-bred, ignorant, and unprincipled quacks, as those by whom we are here infested. Nowhere is the market so overstocked with secret and other quack nostrums. The quack doctors in England are, for the most part, licensed graduates, who have taken to their nefarious practices after obtaining a diploma in some regular medical school. They are, of course, either fools or rogues; but still they are not uneducated men, and there is less disgrace in being placed on an equal footing with them by the public, than we are made to experience in this land of liberty. Here a physician—even of the highest eminence—is regarded in the same light, in a professional and social point of view, not only as an erring graduate, but as the most arrant empiric and ignorant booby and rogue that may be pleased to assume the office and title of doctor.

In Europe, the law for the most part, recognizes regular and legitimate medicine, and none other, and protects the exercise of it. If, in some places, the practice of certain species of quackery, as homœopathy, hydropathy, and the like, is sanctioned, still, it, in great measure, is not allowed to pass out of the hands of regularly educated physicians. From these circumstances, the cultivators of our science—the practitioners of medicine in its legitimate form—have, notwithstanding some drawbacks, a chance of upholding the honor and dignity of their profession, which, by the high standard of education required of them before they can enter its folds, they are so well prepared to adorn. Here, on the contrary, we enjoy no advantages of the kind; for, independently of the fact, already adverted to, that owing to the shortness of the course of instruction in our colleges, and to other facilities offered for obtaining diplomas, our ranks are apt to be filled with men of an inferior stamp and little calculated to do honor to the profession; the latter receives neither protection nor encouragement from the law or the public. Well has it been said that medicine furnishes a proof that by the law, which has, indeed, done all that statutes can do to abolish it effectively, much which, in the organization of society, has been held in a high degree expedient, if not necessary, may be sacrificed to a theory. "Equality," Dr. Clark remarks, "is the procrustean bed to which everything must be shaped," and our profession must submit to the ordeal. Our wise legislators cannot perceive why a man who has not gone through a definite course of study, and passed one or more examinations, should not be as free to practise medicine as he would be to pursue any other avocation without being regularly educated to it. They themselves exercise the trade of politics—they assume the duties of statesmen and make laws without prior training, and, as may readily be presumed, without much acquaintance with those important matters. They might, if they chose—and it is a pity they do not oftener thus choose to do—make shoes, or turn carpenters, or saddlers, or bookbinders, instead of governing the State; and if allowed to adopt, though untaught, either of these modes of earning their bread or accumulating a fortune, why, they ask, may not they or any one else have a like privilege to compound and sell secret medicines, to drug people who wish to be drugged, and—assuming the title of doctor—perform the same duties as regularly bred physicians?

Little does the medical profession merit the treatment here referred to; for it has everywhere greater claims upon the gratitude of the public than the latter seems to be aware of, or at any rate, than has ever been repaid. Medicine is, and cannot be otherwise than, a progressive science. For thousands of years the members of that profession have toiled in the cause of suffering humanity with an ardor and zeal which ignorant, thick-headed, and whisky-soaked legislators, and the illiterate, unwashed, rough-handed portion of the community may be pardoned for not knowing or appreciating, but which should not be overlooked or forgotten by men of a different calibre of intellect, of high social position, and enjoying the advantages of a refined education. Say what the vulgar may, physicians have, in the progress of time, succeeded in erecting a monument which, though not perfect in all its details, rests upon foundations of a lasting character, and the superstructure of which may compare advantageously with those due to the skill and exertions of the cultivators of other departments of human knowledge. Their path from the earliest dawn of science to the present day, has been attended by increasing benefits to mankind.

May we not ask, with one addressing a society kindred to our own, "Is it not true, then, that medicine is the first of the progressive arts; and not first only, but incomparably above and beyond all others in the priceless benefits it has bestowed on man? Yet, who has risen to give public thanks for its Herculean labors? Who has proposed to commemorate the vast achievement of prolonging the years of the life of man more than one-fourth their former average, throughout civilized Europe and America, in the short period of half a century? Well, is it not better thus? for what celebration can adequately commemorate these triumphs of medicine? What monument can typify their greatness? Yet we have a right to demand a fair estimate of the value of our profession to society, and an honest acknowledgment of what it has done for the well-being of man."

In the language of a writer already several times quoted, I may say in conclusion, that "if the public offer us no rewards, no honors, no encouragement, they give us no occasion to complain of their demands. The profession in this country presents the novel spectacle of a body of men conscientiously forcing themselves to acquisitions of knowledge and skill, not only not demanded, but actually discouraged by those for whose benefit they labor. Medicine is the only profession that is striving systematically to resist the down-levelling tendencies of legislation; the only profession which every year demands of its votaries higher and still higher attainments." Well may we say, we are justly proud of our calling, and prepared to respond cheerfully and liberally to its claims. "Medicine demands of us that we be men of integrity and honor; men of character, that she may be respected in us; men of charity, that she may be loved; men of learning, that she may exercise her rightful authority; men of research and labor, that she may claim from each something to be added to the general stock of knowledge." * * *

Nothing, it has always appeared to me, is more devoid of force—I had almost said more senseless—than the opposition that is so often made to what is sneeringly denominated book-learning, and the reason assigned to justify that opposition—*i.e.*, that a physician who spends much time in reading, who is learned in books, and especially who cultivates general literature, cannot, on that account, become an experienced and successful practitioner. Doubtless, as said before, an exclusive devotion to information derived through such means, and a neglect of that furnished by an assiduous attendance at the bedside of the sick, would lead a physician to results of a doubtful character. But because such a mode of proceeding would never enable him to acquire the clinical experience requisite to render him useful in a practical point of view, it does not follow, as is but too often asserted by some physicians, and is still more generally echoed by the public, that a reading physician cannot become skilful and successful in the practice of his art. So far from this, when restricted within reasonable bounds, and combined, as it should and may easily be, with clinical knowledge, that much abused book-learning generally proves of the most decided advantage to the practical physician, and places him in a much higher position in respect to his usefulness as an attendant at the bedside. A well read physician, has more resources at his command when placed at the bedside of the sick. Knowing what has been observed and done by others, as regards the treatment of diseases which fall under his observation, as well in their pure as in their complicated states; aware also of the results of the researches made in various places, and under diversified circumstances, by individuals competent to the task, relative to the nature and seat of those diseases—the symptoms by which they can be detected, the signs by which they may be diagnosed, the textural and organic changes they occasion, or which reveal their true nature—he is better prepared to combat them with success, whatever be the modifications under which they present themselves, and, instead of groping as it were in the dark, resort to the means found useful in the management of cases similar to those before him, but which he may not have already seen in their present aspect. He is more certain to arrive at a correct diagnosis and prognosis even in cases, or modifications of cases, of unusual occurrence. He is less apt to find himself at a loss in moments of emergency, and more adequate to take an enlarged and correct view of the causation and nature of the diseases under his charge, and to deduce from his observations principles calculated to guide him successfully in the selection of his remedial means. To this let me add, that a physician of the class under consideration, is less in danger of merging into the mere empiric, or of lapsing into quackery than the indiscriminate condemner of book-learning. The latter contribute little or nothing to the progress of even practical medicine. They live, they die, and are forgotten. At the time of their disappearance from the stage of life, the amount of practical resources at their command is scarcely greater than it was when they commenced, except as is afforded by a certain degree of familiarity with the salient phenomena and the progression of diseases commonly encountered by them during their rounds, and with the effect, in the treatment of these, of common remedies. They leave nothing likely to benefit others. They are besides seldom fastidious in regard to professional ethics, and are not in general looked up to as beacons for the guidance of their brethren in their endeavors to elevate the medical profession in the estimation of the public at large.

I have said enough to indicate my belief that a physician cannot hope, and is not destined to attain, the object in view, still less to acquire an eminent position among his brethren, and contribute to the advancement of any one of the several branches of the science he cultivates, unless he be endowed with the love or enthusiasm of science, and enters into the pursuit of the knowledge necessary to the proper performance of his professional duties with more than a common alacrity. Medical observation is not simply the result of a passive operation of the organs of sense. It requires, in order to lead to useful issues, a force of mind, a quickness of perception, a degree of penetration, and hence efforts of the intellectual functions—a constant and rapid appeal to the faculties of causation and comparison, which cannot be exercised to the required point unless under the stimulus of enthusiastic excitement. Had he not been under the control of the agitating and impulsive feeling in question, Hippocrates would not have been remembered in after times. Nor would Galen, Celsus, Avicenna ; nor Boerhaave, Harvey, Stoll, Selle, Cullen, J. Hunter, Broussais, Louis (I mean he of Surgery), nor Bichât, Rush, Tommasini, and a thousand others I could mention. None of these, I repeat, could have attained the eminence they occupy, and stamped their names in imperishable letters on the pages of our professional history, had they not felt the vivifying effects of the sacred fire in question.

ART. IX.—*Obstetrics.*

1. *Statistics of Operative Midwifery:* By Dr. Ricker, Monatshr. fur Geburts., Bd. vi, pp. 81-101; and Med. Times and Gazette, Abstract Medical Science.

THIS interesting contribution is derived from midwifery practice in the Grand Duchy of Nassau. This contains 429,341 inhabitants, and there are 100 civil practitioners, besides 20 others who practise while holding military or other appointments. These practitioners are required to make half-yearly returns, stating the characters of prevalent disease, the most remarkable of the surgical cases, and all the midwifery cases. The author has had access to the midwifery returns, and furnishes here an account of the results of his examination, as far as operative midwifery is concerned. Between 1821 and 1842 inclusive, *i. e.* 22 years, 304,150 births were recorded.

1. *Forceps.*—These were employed in 4223 cases, or about 1 in 72 cases. As, however, the earlier returns were somewhat incomplete, Dr.

Ricker believes that 1 in 70 would be nearer the mark. The results were that 93 of the mothers died either during or soon after the operation, and that 684 children were born dead; being 1 death in 45 of the mothers, and 1 in 6 of the children. The indications for the employment of forceps are noted in 708 of the cases only, viz.:

Disproportion of size in the head and pelvis	287
Absence or feebleness of pains	269
Weakness or exhaustion of patient	33
Prolapsus of funis	29
Spasmodic or violent pains	22
Face presentation	20
Convulsions	12
Descent of parts with head	8
Placenta prævia	3
Faulty presentation of head	7
Rigidity	4
Tumefaction of pudenda	4
Erysipelas pudendi	7
Putrescency	1

2. *Turning*.—There were ten cases of cephalic version, and 2473 of turning by the foot, or 1 in 123. The results were 176 deaths on the part of the mother, or 1 in 14, while 1431 children were born dead, or died soon after, or nearly 1 in 2. The indication for turning is recorded in 530 cases, viz.:

Transverse presentation	388
Placenta prævia	82
Prolapse of funis	28
Narrow pelvis	18
Hæmorrhage	5
Other dangerous affections	4
Face presentation	2
Faulty presentation of head	2
Convulsions	1

3. *Perforation* was resorted to in 143 instances, or 1 in 2126. There were recorded 88 recoveries and 35 deaths, while in 20 cases no results are given.

4. *Dismemberment* was effected in 22 cases, 16 mothers recovering and 6 dying.

5. *Cæsarian section*.—Between 1821 and 1843, with 311,409 births, this operation was performed 12 times, 2 mothers and 7 children being saved. This gives about one Cæsarian operation in 26,000 births. The operation was performed 33 times after the death of the mother, but none of the children were saved.

The author compares these results with the statistical accounts of the authors; but these being well known we have not quoted them.

2. *Extra Uterine Pregnancy*.—(Transactions South Carolina Med. Association, 1857.)—A letter from Dr. Andrew Hassell was read by

Dr. DeSaussure, relative to a very interesting specimen of *tubal pregnancy*, which accompanied it, a present to the Association.

The following extracts from the letter are of interest:

The specimen of extra uterine pregnancy was removed from a negro woman in September, 1856, six hours after death. She was 35 years of age, had been twice married, had enjoyed excellent health to within two years, since which time her catamenial discharges have been irregular as to quantity, accompanied by so much dysmenorrhœa as to compel her to keep her bed for a few days at each menstrual period. Her complaints had become more urgent from the commencement of 1856. About a fortnight before her death, and after a confinement of five or six days to the house, she was visited by Dr. Post, who found her suffering from much pain, seated in a tumor in the right iliac region, corresponding to the position of the ovary. The tumor could be elevated or depressed by manipulation. No indication of the nature of the tumor was furnished by an examination per vaginam or per anum. During the treatment she had exacerbating pains, with intervals of comparative ease; at which time she could take exercise and appeared cheerful. The night previous to her death she suffered intense pain, and was found in the morning with all the symptoms of a ruptured uterus, viz: cold clammy sweats, thready pulse, rejection of the blandest fluids, etc. Upon careful auscultation at various times no indication of a placental circulation could be perceived. An autopsy was made six hours after death. The abdomen was found distended, with clotted blood. The fœtus was found detached, when the uterus, with its appendages had been carefully removed. Dr. Hassell supposed that the separation had taken place some time prior to death.

Dr. Chisolm having examined the specimen, by request of the President, reported the following results: The position of the ovum was in the fimbriated extremity of the right fallopian tube, which had been converted into a cyst of near four inches diameter. To the upper portion of this cavity a well formed placenta belonging to a fœtus of at least 3 months, was firmly attached: there was no umbilical cord hanging from the mass. The walls of the cyst, exclusive of placenta were $\frac{1}{8}$ of an inch thick. A very large rent, nearly as long as the diameter of the sack, gave free exit to the contents, and was the source of the fatal hemorrhage. The detached fœtus was $4\frac{1}{2}$ inches long and well-formed. The cuticle upon its neck appeared for a limited space to have separated from the true skin, which led him to suppose that it was the results of decomposition, and that therefore a considerable interval had elapsed between the death of the child and that of the mother. The fallopian tube for the distance of nearly two inches from the uterus was pervious, and a bristle passed readily into the uterine cavity. The ovaries were apparently healthy. Several small cysts existed over the peritoneal surface of the uterus, contents grumous. One in the immediate vicinity of the left ovary contained 3 or 4 drachms of curdy matter, slightly yellow in color, which was supposed to be pus coagulated by the alcohol, in which the specimen had been kept six months prior to presentation to the Association. The uterus was enlarged to three times its normal size.

On motion of Dr. Geddings the thanks of the Association were returned to Dr. Hassell for the rare and valuable specimen, which would be deposited in the museum of the Medical College of South Carolina, where two similar specimens are to be found, one deposited in 1850, the other in 1856.

Art. X.—*Progress of Anatomy and Physiology:* By Dr. Thomas Hayden. (*From the Dublin Hospital Gazette.*)

Living beings are offered to our notice under two aspects—as presenting forms and performing functions. The department of science which treats of them in the former relation is called Morphology, that in the latter Physiology. These two grand divisions of biology are themselves resolvable—Morphology into histology, which treats of the elementary structure of tissues ; anatomy, of their perfect structure and mutual relation ; and palæontology, which professes to infer form and function from the fossil remains contained in the earth's crust. Physiology, likewise, into physico-chemical, of which the province is to investigate the laws governing the physical actions of organized bodies ; and psychology, those relating to mental operations. Living beings may be either dormant or active. If dormant, they are capable of being roused into action by certain agencies, viz : heat, light, moisture, and electricity, which are hence called vital stimuli ; and in this state they are distinguishable from *not*-living beings by their tendency to pass through a cyclical succession of changes of form and composition, whilst the latter are either stationary or undergoing disintegration. Again, a living being is remarkable in that it never presents a regular geometrical figure or plane surface, like a crystal ; and further, it invariably exhibits a definite structure. No living being consists chemically of less than three elements, and probably four, viz : carbon, hydrogen, oxygen, and nitrogen, in the proportion in which they form protein ; whilst inorganic bodies present the most varied chemical constitution, from a simple element to the most complex atomic arrangement. The allied forms of animal and vegetable organization are distinguishable rather by functional than by structural peculiarities ; thus, the lowest plant as well as the highest, possesses the remarkable power of *feeding* upon the simple elements, oxygen, hydrogen, nitrogen, and carbon, detaching them from their binary combination in air and water, and uniting them into the ternary and quaternary compounds of chlorophyl, albumen, and starch ; whilst animals derive their nutritive supply exclusively from organic substances, and thus are dependent, directly or indirectly, upon the vegetable kingdom. Plants appropriate their aliment by imbibition through the external surface of their bodies ; animals either possess or extemporise a digestive cavity, in which the primary stages of alimentation are performed. Plants are either wholly incapable of spontaneous motion, or, in the few examples in which they possess this faculty in their embryo condition, it is accomplished by the action of cilia, and has reference entirely to their dispersion ; animals, on the contrary, in their simplest known forms, effect change of place by motions indisputably voluntary. The boundary line between the animal and vegetable kingdoms is not, however, strictly defined ; rather it is transgressed at certain points, in such a way that the adjacent territories are, as it were, dove-tailed into one another. The Acephalocystis endogena, or pill-box hydatid, has neither a permanent nor temporary stomach, and obtains its food by superficial imbibition, like a plant. Amongst vegetables, the Sarraceniæ possess peculiar organs, called pitchers, into which insects are attracted by the presence of a sweet gummy secretion, and their exit barred by long hairs growing from the inner surface ; within these receptacles their bodies are dissolved, and appropriated by the vegetable tissues ; here we have something exceedingly like a digestive cavity, and digestion of solid and organic aliment. Thus, then, it may be said, so closely allied are the two great organic kingdoms of nature, that, as represented by their lowest forms, they might be readily confounded with each other, and so intimately related, that even when best defined, they still touch by their angles, but from these points of mutual contact they diverge almost indefinitely. All animals agree in the possession of three essential properties : *absorption*, *metamorphosis*, and *irritability:* the first physical, the second chemical, and the third vital ; and their chief morphological differences depend upon the multiplication of organs in subjection to these properties. This law, of the physiological division of labor, is universal throughout the animal kingdom, but of the organs destined to execute it, there is a difference in *kind*, for the several classes of a sub-kingdom, and in *degree*, for the orders of a class ; and both increase with the distance between the extremes in each class and order. The morphological differences just adverted to, as having direct reference as to function, constitute typical variation, and form the basis for the natural division of the animal creation into the five grand types—Protozöa, Cœlenterata, Molusca, Annulosa, and Vertebrata.—*Huxley.*

Schleiden and Schwan taught that all organized structures, both animal and vegetable, originate from cells, as their primary or embryonic form ; that these cells are anatomically and physiologically independent; that they are the causes or *centres* of organization ; and that all organs and organisms result from their coalescence ; that a typical cell consists of cell wall, cell contents, and cytoblast or nucleus ; that new cells were formed by the development of new cytoblasts in the surrounding cytoblastema ; and that the cell wall was secreted from the surface of the cytoblast, and subsequently separated from it by the accumulated liquid cell contents. In this theory of cell generation a very important element, as far at least as regards vegetable anatomy, was entirely overlooked, the primordial utricle of Von Mohl ; this is a nitrogenous membrane, lying within, and in close contact with the cellulose cavity, or so called cell wall of Schleiden and Schwan. These authors assumed that the cytoblast was the essential or formative element of the cell ;

but the observations of Mr. Henfry have shown that no cytoblast exists in the germinating parts of young ferns ; and many similar examples amongst animals and vegetables may be adduced. Modern research has satisfactorily proved that the primordial utricle is, in cell growth, what Schleiden and Schwan believed the cytoblast to be—the essentially formative organ of the cell ; for in its substance nuclei have been observed in process of development, and new cells to result from its division ; and further, the observations of Wenham on anachais alsinastrum, those of Mr. Davy on the briony plant, and Mr. Rainey on the development of the tentacles of cysticercus have clearly demonstrated that at no period of the development of these structures are cell formation and cell growth, as commonly understood, to be observed. The primary basis of all organized structures consists of two elements—a clear homogeneous matrix, called periplast by Huxley, and a number of minute bodies dispersed through this, the endoplasts of the same writer. The latter, in their simplest form, are solid spherules, composed of a structureless material named protoplasm, destitute of a limitary membrane, and generally containing in their centre an aggregation of granules constituting a *nucleus.* The simple structure now described, represents the earliest stage of organization with which we are acquainted, and through it all organized tissues, no matter how highly developed subsequently, must pass in their upward or *histogenic,* and in all probability also, in their downward or *histolytic* course. Beyond this primary stage, however, a number of vegetable structures never proceed ; such are the protophyta or confervoid algæ. If a higher grade is to be attained, the endoplastic bodies are converted into cells, by a process of differentiation of the originally simple spherule into cell wall, primordial utricle, cell contents, and nucleus ; the agency by which this is accomplished is involved in the mystery of life, and is indifferently named vital force, metabolic force, or *vis essentialis.*

With the formation of cells, what might be called the second stage of organization is attained, and is represented in a persistent form by the cellular tissues of animals and vegetables. All further progress towards the higher grades of development is effected by the modification of cells ; and the study of this, in its various ramifications, constitutes the special department of histology.

Cells, then, are not the *centres*, nor even the *instruments* of organization ; they only constitute one stage of the process, and appear to possess no special influence beyond the limits of that stage. Life is, in all probability, *molecular* not *cellular*, and cells are the exponents of vital phenomena only in the proportion of their constituent granules.

The process of growth involves two distinct operations—*accretion* and *differentiation.* In that stage of development which I have ventured to designate the first, and of which the protophyta amongst plants, and the protozoa amongst animals, afford striking examples, growth appears to consist in a simple accretion or coalescence of particles, without further differentiation of parts than a slight difference of consistence between the periplast and the endoplasts ; but in all stages above this, there is both a morphological and a chemical differentiation, the former consisting in vacuolation and fibrillation, the latter in conversion and deposit.

One of the humblest forms of vegetable organism is the *palmoglæa macrococca*, found to consist of a simple mass of nitrogenous substance, named protoplasm, containing a nucleus and some chlorophyl granules, and embedded in a viscid homogeneous matrix. Multiplication is effected by spontaneous division of the minute body into two portions, which are next separated by the ingrowth of the surrounding matrix, each segment becoming a perfect representative of the original. These changes may be seen actually taking place by microscopical examination. Parallel examples from the animal kingdom are furnished by the *amœba* and *actinophrys*, which are simple accretions of a substance called sarcode, by Dujardin, without investing membrane or internal structure. In the interior may be observed one or two vacant spaces, the walls of which are endowed with a contractile property, and are seen in the living animal to contract and dilate alternately, at a fixed rate, which I have determined in the vorticelli, a closely allied organism, to be five times in a minute. The amæba assumes a variety of forms, and is hence sometimes named proteus; it advances by projecting a portion of its body in the form of an elongated process, which it fixes to the neighboring surface, and by this means drags the remainder along at a sluggish pace; if in its course it happen to encounter a suitable particle of aliment, it forces this through the soft tissues of its body into the interior, where its nutritive elements are absorbed, and whence the refuse matter is expelled by a similar process. The actinophrys differs from the amæba only in preserving a definite form, and possessing a number of long prehensile organs, called pseudopodia, by means of which it grasps and engulphs its prey. Thus, the only distinctive character between these lowly creatures and the humble Palmoglæa, consists in the possession by them of a contractile vesicle, and of the faculty of progression; they both fall short of the degree of development attained by an ordinary cell, form the starting points respectively of the animal and vegetable creation, and are, therefore, appropriately named—the one, *protozöa*, or primitive animals; the other, *protophyta*, or primitive plants.

As an evidence of the importance of the study of typical organization as tending to facilitate the labors of the naturalist, and of the great progress now being made in the elucidation of this subject, may be mentioned the relations recently proved to subsist between the tænioid and cystoid organisms. Up to a very recent period these two families of entozoä were regarded as perfectly distinct; but by the labors of Von Siebold and Van Beneden, their identity has been placed beyond the possibility of cavil. The distinguished professor of zoölogy in the University of Louvain, has divided the development of Tænia into four stages: those of the embryo, scolex, strobila, and proglottis. The embryo is a vesicle with hooklets attached to one portion of its surface. The scolex in addition, develops a head, with its appendages of hooklets and suckers. The strobila is the perfect tapeworm; and the proglottis one of its somites or segments detached and distended with young. The detachment of proglottides takes place from the posterior extremity of the body, whilst at the same time other segments are formed or inserted between the head and neck of the animal; there is reason to believe, however, that the scolex is the formative part, and herein lies an explanation of the circumstance known to all practical physicians, that without the expulsion of the head of the tapeworm, a cure from that parasite cannot be affirmed. The identity of the cystic and cystoid organisms has been proved experimentally by Leuckhart, Van Beneden, and Von Siebold. Puppies have been fed with cysticercus pisiformis, and in the course of a few weeks their intestines were found nearly full of Tænia serrata; on the other hand, a rabbit was fed with the ripe proglottides of Tænia serrata, and a week afterwards, its liver was studded with minute cysts containing ascaroid formations. In another rabbit similarly treated, these were found in the scolex stage, in the peritoneal cavity. The liver of white mice, fed with the proglottides of Tænia crassicollis, was found infested with cysticercus fasciolaris, and the muscles of pigs fed on Tænia solium, presented the cysticercus cellulosus, constituting the condition commonly known as that of measley pork. A lamb fed on Tænia serrata, manifests within a fortnight symptoms of the disease called staggers, and a week or two subsequently its brain is the seat of cœnurus cerebralis.

It is well known that the intestinal canal of carnivorous vertebrata, such as man, the dog, the cat, the lion, is the sole habitat of Tænia; whilst cystoid entozoä may infest the muscles, the eye, the liver, the brain, and other parts of vertebrate animals, both carnivorous and herbivorous; and further, that certain species hitherto regarded as distinct in their origin and organization, are peculiar to certain parts of some of these animals, as the cysticercus cellulosæ to the intermuscular cellular tissue of man and the pig, and cœnurus cerebralis, to the brains of young sheep. With the facts just enumerated before us, we can have no difficulty in comprehending the cause which determines the development of the embryo cysticerque into the Tænia, in the body of the dog; and that of the proglottis of Tænia into cysticercus or cœnurus in the rabbit or lamb; it lies in the law of modification of species dependent upon locality.

The three great branches of biology—development, structure, and function—were probably studied, at least primarily, in inverse order: function excited the wonder of man; from this arose curiosity to ascertain structure; and then, again, to determine the process by which this structure came to be.

The different parts of living beings are mutually related. This correlation is of two kinds—*physiological* and *morphological*. The physiological correlation implies a typical conformation of organs, leaving a broad margin on either side, within the limits of which it is possible to deviate without deranging their harmonious action, or materially altering the result. Thus, the multicuspid teeth and quadrilocular stomach of a ruminant, are physiologically correlated, the common end being alimentation. Yet a deviation from the typical number or conformation of the teeth, or even their total absence, will not seriously modify the nutritive process. Again, although the laniary teeth of the tiger would enable us to predicate of that animal the possession of a simple stomach, were we to reason from the same premises to a similar conclusion in the case of the dog, whose teeth are no less efficient instruments of laceration, we should fall into a serious error, for the digestive tube of this animal, as will be observed, is by no means a simple organ.

The laws which govern *morphological* correlation are, on the contrary, simply empirical. We know from experience that certain organs and a definite conformation of them co-exist in the same animal ; but as to *why* they do so, morphology taken exclusively teaches nothing ; physiology, however, supplies this deficiency, and explains the *why* by reasoning out the common end. Thus, then, these two branches of natural science interpret each other, and it is impossible to study either efficiently, and in the full measure of its attractiveness, without the aid of the other.

ART. XI.—*Case of Hypertrophy of the left Mamma.* By J. A. LAWRIE, M. D., Professor of Surgery, University, Glasgow. Read before the Glasgow Medico-Chirurgical Society.

MISS M. W., aged 13; healthy girl. In October, 1855, the left mamma was observed to be considerably enlarged, having the appearance of that of a young adult, while the right had the undeveloped dimensions of a girl of 13. In every respect, except size, its aspect and feel were those of health. I had no difficulty in at once diagnosing simple hypertrophy of the mamma. I gave a very doubtful prognosis as to the result of treatment, expressing, at the same time, a hope that its progress might not be very rapid. In December she had measles, without any obvious effect on the mamma. Soon afterwards she went to the country, and on returning in March, 1856, I was distressed to find that the enlargement was making very rapid progress. As she had not menstruated—steel, warm hip-baths, and other supposed emenagogues were prescribed, but without avail. Iodine had been previously tried to no purpose. The mamma was now as large as a full-sized fœtal head, with large tortuous veins, coursing over it, but in no other respect differing from a large virgin gland. I still adhered to my previous opinion that the disease was simple enlargement, dangerous only from its size and rapid growth, and from not being at all amenable to treatment. A consultation being proposed on the 24th April, 1856, I called in one of the most experienced surgeons in Glasgow, and suspicions arising as to the disease being soft cancer and not hypertrophy, immediate amputation was recommended. This opinion being communicated to the girl's relations, we were urged not to lose time, and, accordingly, I removed the entire gland next day. Much to my relief, my original diagnosis proved correct; examination showed the enlargement to be hypertrophy in its purest and simplest form. The wound healed readily. In June, 1856, two months after the operation, she menstruated, and I saw the young lady yesterday in perfect health.

This case was to me one of considerable interest for the following reasons:

1. *Its rarity.*—It is the only example of pure hypertrophy in the girl I have met with. Large pendulous breasts in elderly adults I have frequently seen, but only this one of simple hypertrophy at the age of approaching puberty. Some here present may be aware, that in the first volume of the Glasgow Medical Journal, I published a fatal case of hypertrophy of both mammæ in a woman aged 30; but that case differed in many respects from the present. At the time I considered it unique, at least in as far as the literature of the disease goes. Velpeau says, simple hypertrophy is less common in France than in England, Germany, America, Egypt, and India, and in all his extensive experience had only met with six or eight cases, all of which do not appear to have been genuine.

2. The diagnosis, according to Velpeau, is easy, and if seen from the early stage, and watched as I had the advantage of doing with Miss W., it ought not to be difficult. Seen, however, for the first time, at a more advanced period, this case proves that it does present some points of close resemblance to soft cancer. Velpeau says, "in short, one symptom will obviate any mistake, and it is that in hypertrophy, except in size, there is no change in the affected organ." With all deference, this is hardly correct. The color of the hypertrophied breast is at times somewhat livid, and it is almost always traversed by large distended veins, which is also often the case in the fungoid disease, while it is absent in mammæ naturally large, but not diseased. There is, however, no alteration in the nipple, and I believe it generally wants the tense elastic semi-fluctuating feel, with partial discoloration of the surface, so commonly met with in fungoid disease.

3. *The age.*—This girl was unusually young. Velpeau says he has never met with it before 15, or after 40 years of age. Miss W. was 13 years and six months when I first saw her.

4. Its rapid growth was, latterly, alarming. The operation was performed within six months from the time that I first saw it.

5. *Treatment.*—Our best and most experienced surgeons agree in saying that treatment, either local or general, is of no avail. Velpeau seems to have found iodine and pressure of use in one case, and in one only did he amputate. I see no reason to regret the course followed with Miss W. The rapid progress of the disease, in spite of treatment, the complete success of the operation, the supervention of menstruation, and the present perfect health, make it almost fortunate that a doubt as to its true nature hastened the operation.

The ultimate result of other cases of hypertrophy which have not been amputated, or in which amputation has been long delayed, would not induce me to modify this opinion. In some, as in that of Mary Bradford, related by the first Mr. Hey of Leeds, the gland attains an enormous size ; and amputation, when ultimately demanded, may come too late to arrest deformity, and when performed, is proportionally much more dangerous.—*Glasgow Med. Jour., April*, 1857.

REVIEWS.

Rev. I.—*A Manual of Examinations upon Anatomy, Physiology, Surgery, Practice of Medicine, Obstetrics, Materia Medica, Chemistry, Pharmacy, and Therapeutics. To which is added a Medical Formulary. Designed for Students of Medicine.* By J. L. Ludlow, A. M., M. D., Fellow of the College of Physicians; Member of the American Medical Association; and one of the Consulting Physicians to the Philadelphia Hospital, etc., etc.; a new edition thoroughly revised and much enlarged; with 370 illustrations. Pp. 816, large 12 mo. Philadelphia: Blanchard & Lea, 1857.

In his preface Dr. Ludlow says that this book "claims to give at a glance the priuciple* [principal] points necessary to guide the student in the prosecution of his studies, and to revive his recollection of subjects treated upon in more voluminous works. He has not been unmindful of the advantages of illustrations, which have been freely distributed throughout the work."

As time will not permit the reading of the entire book, it may be most profitable to examine portions of it chiefly in relation to the viscera and the structures which are most concerned in pathological anatomy, which, with physiology, are at once compass, chart, and polar star to the young pathologist who embarks upon the somewhat dubious voyage of medical practice.

In the book under consideration, correctness not originality, is expected. The whole realm of medical science being before the writer, he chooses and uses the best; he exercises the talent of rejection as well as that of selection; he neither dwells upon truisms nor dubious speculations; his facts and principles are grouped so that the greater shall include or suggest the lesser, thereby showing the skeptical doctor who declared the whole system of medicine could be written on one page, that 816 pages can be filled without exhausting the science.

In the building, or rather in the ornamenting of this book, the author appears to have luxuriated in the gallery of engravings possessed by the great publishing house of Blanchard and Lea, whence emanates a

* The typographical errors in this work, are, for a Philadelphia book on Education, not few: as Gerard for Gerhard; corda tendinæ for chordæ; cinerium for cinereum; gatrorrhœa for gastrorrhœa; spinal senses for special; hemaplegia for hemiplegia, etc. These, however, are innocent babes compared with others which continue from page to page destroying in some instances the sense, as may perhaps be shown in the sequel.

majority of the medical books now in use in this Republic, from Maine to the gold shimmering shores of California. Those engravings if not new are useful; yet if they correspond neither to the opulence of the publishers nor to the increasing typographical elegance of the books of some rival publishers, they may still prove very acceptable to students who may not have had the same once or oftener in their text books. If Dr. Ludlow's compilation should prove to be neither the best nor the worst book of the kind extant, the 370 engravings for ornament and use ought to recommend the book, reward the publishers, and bring fame to the author, instruction to intending candidates, with fits—fits of despair at such a frightful array of questions, or, judicially speaking, *the question*, that is, the torture.

This book, which has passed through several editions is, or ought to be, or the author can make it an excellent one to carry in the practitioner's saddle-bags, to refresh his memory during his long journeys into the country, while tarrying to bring some one into, or prevent some one from going out of, this world.

Many of the engravings, however, are of no more value than hoops without a Venus in them. Of 37 obstetrical engravings one only is explained. All of the illustrated articles of the Materia Medica which have letters or numerals affixed, amounting to more than a dozen, are in the same category. Even in the anatomical department from No. 120 to 154, the same omissions occur. The student turns from A to Z, and from 1 to 20 more or less, but like the sightless Milton,

> "Finds no dawn
> But clouds instead—the book, a blank."

There is a place in Virginia called Muddeltypeg. But how could the student of geography find this spot upon a map of the world entirely destitute of the names of places? Answer that, thou great questioner, Dr. Ludlow.

As the writer of this notice has never before read any work on Examinations, he cannot err in saying that this is, with its exuberant adornment, the best he has ever examined. "A man who has never seen the sun cannot be blamed for thinking no glory can exceed that of the moon."

The Examinations is among duodecimos a colossus, expanded into 816 pages, being *enceinte* with fifteen or twenty thousand questions and answers. Very little can be said justly against the size of a book provided the expansion from within be solid and free from dropsy and flatus. The interior of this book keeps pace with the exterior dimensions with sundry woful exceptions.

In a book, such as the Examinations, it is easier to make a big than a small one. The principle of exclusion must be carried to its utmost allowable limit without sacrificing any fundamental principle or essential detail. Every question that can be eliminated, rejected, or abbreviated, adds to the value of an elementary work intended to test the qualifications of the candidate for degrees. Clear ideas, fundamental truths can generally be expressed in a few and simple words, and the examination into details should have constant reference to these elementary principles. A child will sometimes be able to repeat the rules of grammar without understanding one of these rules, and the same thing may happen in certain medical matters.

As this book is intended to be a standard for testing the education of doctors, it is the more worthy of an examination itself. It is very important that the primer and the spelling book should be examined with attention.

This book is not without platitudes and common places which can in no respect aid the student: "What is meant by the mouth? That cavity bounded above by the palatine arch, below by the tongue and muscles beneath it, before by the lips, and behind by the velum palati and pharynx. The anterior aperture is called fascial, the posterior pharyngeal." Four other paragraphs after this fashion are devoted to a general description of the mouth without any scientific description or enumeration of its organs. "Where is the abdomen situated? Between the thorax and pelvis." It might be taken for granted that no one having a belly could fail to answer this question.

"NOSE. How is this divided? Into an external prominent part and internal cavity. What are the external parts? The root; arch, tip, alæ and nostrils." If Sterne can be relied on in the matter of Slawkenbergius' nose, such questions have been raised at Strasburg as well as at Philadelphia. These answers are easy; indeed when anything is too obvious to admit of anything so plain as itself, it is usual to say that it is as plain as the nose on a man's face, which is more concise than saying it has an outside, an inside, a root, an arch; a beginning, a middle, and an end like the epic poem.

Other similar questions abound in this book: "Where are the eyes situated? In the orbits, etc." "What is the form of the *globe* of the eye? Nearly of a *spherical* figure." The answer to one question is—"Atmospheric air plays an important part in respiration." Did any one doubt it? It might be asked with more propriety—"What is death, but loss of breath?"

Nothing is more difficult than to prove a truism or a self-evident truth, since the latter is clearer than any other proof. Ask the student to prove the existence of a material world, and his answer, the more he elaborates it, will be darker and darker, and, indeed, upon the representational theory of ideas and transmitted impressions as being alone cognizable, he must admit that knowing these only and not matter, he is left without any proof of the reality of a material world.

Instead of dwelling upon platitudes and truisms of no value, the author might have entered upon some fundamental departments of medical science which he has entirely omitted, as for instance, the physiology of reproduction, development, etc.

"What are the contents of the abdomen? Besides the peritoneum, it contains the organs of digestion and chylification, viz: the stomach, intestines, liver, spleen, and pancreas; the urinary organs, viz: the kidneys, ureters, and bladder; and lastly, part of the organs of generation." This enumeration is imperfect, omitting as it does the omenta, mesenteric and lymphatic glands, thoracic duct, lacteals, aörta, cavas, portæ, the solar plexus, etc., all of which should be viewed *in situ* before commencing the dissection of the organs in making a post mortem examination. It is true that some of these omitted structures are referred to subsequently. "What is the pancreas? It is a long, flat, glandular body of a grayish-white color." Neither here nor elsewhere is the probable size, length, nor the consistence of this and some other organs indicated. The whole description is imperfect; not excepting the color, which is not "a grayish-white" but a grayish-red, or rather a faint pink color.

"What is the gall bladder? It is a small bag which contains the bile." This trivial question coutains the answer. The gall bladder is the gall bladder. Many similar questions, gravely put, virtually contain their answers: "What do you mean by varioloid, or modified small-pox?" The most concise answer would be—modified small-pox, or a disease resembling small-pox.

"How is the mesentery formed? By two layers of the peritoneum, which separate at the loose or folded edge to *surround* the intestines." Now the peritoneum, a closed sack, does not *surround*, but almost entirely covers the intestines, which latter are outside of the former in an anatomical point of view.

The color of the liver is described; "a brownish yellow." It is of a reddish brown.

"What is the color of the blood in the arteries and veins? In the arteries it is bright red, and in the veins of a *more purple hue*." More purple than in the arteries, where it is not purple at all!

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The anatomical account of the cerebral meninges is inaccurate. The internal surface of the dura mater is described as "smooth, polished, lubricated." This surface consists of the reflection of the adherent arachnoid, which latter membrane the author describes as being "a delicate transparent serous membrane, spread uniformly over the surface of the brain." He should have added that this membrane is not restricted to the brain, being a sack, the external portion of which is spread over the inner surface of the dura mater, the internal over the pia mater. It is therefore a closed, collapsed sack, which in the normal state, contains a little serosity, being adherent on one side to the pia mater, on the other to the dura mater.

The diseases of this serous membrane render its anatomy of high importance, being in a great degree *sui generis.* Arachnitis produces whiteness or opacity, not redness; increased thickness and tenacity, with serous, milky, gelatinoid, and sometimes sanguineous effusions into its sack. This sack is sometimes the seat of false membranes and of tubercular deposits in small hard granules, giving it in the latter case, a rough, grater-like appearance on its surfaces. The injection and vascularity of this tissue, of which Dr. Ludlow speaks more than once, do not occur in New Orleans.

To call typhus fever *typhous* fever, as the author uniformly does (pp. 410–11–12,) is a three-fold error. There is no typhous fever, as this epithet designates not a special disease but a condition which may occur in almost all maladies characterized by debility, prostration, or adynamia. There may be a typhous state in pneumonia, bronchitis, pleurisy, peritonitis, ophthalmia, phrenitis, mania, intermittent, remittent, yellow fever, dysentery, scarlatina, measles, and so on to the end of the nosology.

Typhous fever is not typhoid fever. The latter is generally considered a distinct fever, though, if the term typhous can have any substantive application, it must be to typhoid fever. This would be virtually to ignore typhoid altogether as being anything but an adynamic or prostrated condition of the vital forces, which, as has been already said, is seen in certain stages of almost all diseases. But the author does not view typhous fever as the synonyme of typhoid, because he devotes the next article after *typhous*, to *typhoid* fever, which latter he recognizes as a distinct fever, though he affirms that "it bears a general resemblance to the typhous variety." He even draws the differential diagnosis or contrast between these fevers far more prominently than usual, following up these distinctions through nearly three pages. "What," he asks, "is the general estimate of the occurrence of the affection of the glands of

Peyer? In about ninety-eight in the hundred cases. Mention cursorily the chief distinctions between the typhous and typhoid fevers? In investigating the symptoms of the typhous and typhoid fevers, we observe the latter not confined to any particular season; it commonly attacks individuals of a particular age and exposed to some unaccustomed mode of life, sometimes occurs at the same time with an epidemic of autumnal intermittent, or of typhous; when the initial period of the disease has passed, typhoid fever may be easily recognized: 1st, typhoid is usually a sporadic disease, on the contrary typhous is rarely so; 2d, typhous is contagious, typhoid is not, under ordinary circumstances; 3d, the initial symptoms of the two chiefly differ in the greater stupor, dulness, and prostration of typhous, which are in contrast with the moderate cephalalgia, disturbance of the senses in dothinenterite," etc., etc.

Now all this evidence, showing that typhous differs from typhoid, is *à fortiori* valid against the identity of the assumed typhous and typhus. Typhus, sometimes called jail, camp, ship, hospital or putrid fever, is an idiopathic, well-defined disease, and not an accidental *typhous* or adynamic condition. *Sthenicous*, and *asthenicous* would be quite as accurate in style and in pathology as the names of individual diseases as *typhous* is as the name of a special fever.

The lesions of Peyer's elliptical plates so far from occurring ninety-eight times in every hundred cases of typhoid, as above mentioned, probably occur in a well marked and grave form in but little more than half as high a ratio as here announced, while these same lesions are found, though in a diminished proportion, in other diseases.

At page 115 the *ileum* or small intestine is called *ilium* ten times, not to mention other parts of this book on education. Long before Celsus, as well as since, the term *ileon*, *ileum* from the Greek *eileo* or *eileos*, has been applied to the small intestine. *Ileus*, or *ileus volvulus*, from the days of Hippocrates, has been used to designate a grievous disease or obstruction of the ileum. The moderns have enlarged the nomenclature, as, *ileus spasmodicus*, *ileus inflammatorius*, etc. Celsus quotes the word in Greek from Diocles, who designated *ileus* as disease of the *large* intestine, a postulate which Celsus criticises as contrary to the accepted application of the term then in use, *ileus* being an affection of the *small* intestine.

This term has been used as the prefix to many words in use both pathological and anatomical, as ileo-colitis, ileo-cholosis, ileo-flavus, ileo-colicus, ileo-typhus, ileo-lumbar, ileo-cæcal valve, etc.

Ilium is the haunch bone, a portion of the os innominatum, and has in like manner given origin to numerous prefixes in *ilio*, which represent this bone's relations to different fossæ, vessels, muscles, regions, etc.

"What are the agminated glands of Peyer, and the glands of Brunner? Elevated patches on the small intestine, and may be considered as secreting parent cells, developed in the tissue independently of the mucous surface, and only connected with this surface to facilitate the exit of their contents. Brunner's glands are situated in the duodenum, a type of more complex glandular structure."

These glands are not elevated *on* the intestine, nor are they *independent* of the mucous surface, as this description of their physiological anatomy assumes. They are imbedded not in the mucous so much as in the sub-mucous tissue, being so deeply sunken as to escape common observation unless greatly altered by congestion, infiltration, hyperæmia or ulceration. In fact, so far as the unassisted eye can decide, the Peyerian patches or illeptical plates are little recognizable in their normal state, being apparently the creation of disease. In many diseases as well as in typhoid fever, they are developed, thus altered, as in yellow fever, cholera, consumption, typhus, etc.

The lesion of the Peyerian glands so much dwelt upon, not to say exaggerated, of late, is slight, consisting of hyperæmia, granular hypertrophy, or pustulation, and rarely ulceration. This if compared with any other type recognized as a mortal lesion in the mucous tissue of the alimentary canal, as that of dysentery for instance, is insignificant as explanatory of the cause of death. As a grave lesion, it was scarcely even mentioned by comparatively modern authors of ability and observation, as Baillie, whose morbid anatomy was published little more than half a century ago. Moreover, the function of these glands in their normal state is a physiological ænigma.

Excepting occasional allusions to post mortem examination, there is but little in this book from which one can infer that the all-important science of pathological anatomy forms a fundamental part of the examination for the doctorate. Dr. Ludlow says in his preface that he claims for his book "simply what its title indicates." The title, though vastly extensive, omits pathological or morbid anatomy and even pathology altogether. That student who has just notions of the fundamental principles, and anatomical criteria or characters of general and special pathological anatomy, though he may not be able to describe all of the muscles, nerves, blood-vessels, etc., will probably make a better pathologist and practitioner than he who can describe every muscle, etc., and write all the prescriptions in Dr. Ludlow's Formulary, without having correct opinions as to the natural and morbid appearances of the organs, tissues, fluids; size, cohesion, density, color, vascularity; albuminuria, cysts, scirrhus, hæmatodes, tumors, anæmia, hyperæmia, gangrene, hæmorrhage, œdema, exudation, pyæmia, hypertrophy, atrophy, tubercle, etc.

The comparison of organs among themselves as to size, cohesion, color, etc., is highly instructive and necessary. The natural consistence of the pancreas, while it affords a near approximation to scirrhus in most other organs, would for most of them, clearly indicate morbid change; conjunctivitis produces redness and vascularity—arachnitis, whiteness and opacity; the natural color and consistence of the liver, would be morbid in the lungs or brain, etc., etc. Hence, it is important to keep in view the physical appearances produced in different tissues by the morbid changes called inflammation, hyperæmia, tuberculosis, etc.

"Does the temperature of an inflamed part ever exceed that of the blood at the source of circulation? It does not." There may be some book-builders who sustain Dr. Ludlow, but late experimentalists have fully established the contrary both in the living animal and in the recently dead human body, not to name the facts of daily practice, in which the inflamed part, as a burn, a furunculus, a local phlegmonous erysipelas, etc., on one side, or limb, is found to be hotter than the opposite one, though both get their blood from the "source of the circulation."

The treatment recommended for inflammation is blood-letting and the like, opium being allowed in "certain cases." Yes; and so are stimulants, tonics and diet. Dr. Ludlow's practice in inflammation, yellow fever, etc., etc., is sharp, sanguinary, and but little qualified. He cures apoplexy, and palsy by "bloodletting locally and generally carried to great extent," etc. The experience of the last thirty years has constantly tended to limit this mode of treatment, insomuch that it may now be regarded as applicable to exceptional cases, not as constituting the general rule. The statistics of general "bloodletting to great extent" in even apoplexy are unfavorable to that mode of treatment.

The treatment of acute inflammation by repeated "bloodlettings carried to great extent" will not always prove curative; it will, indeed, sometimes increase the disease and hasten disorganization and death. Moreover, experimental bloodlettings on healthful animals have indeed the phenomena of inflammation. The late M. Magendie bled animals from time to time until he killed them with inflammation, attended with engorgement, œdema, pneumonia, and "the entire train of what are called inflammatory phenomena." The obstetrician will often see after almost fatal hæmorrhages, these very phenomena. Woe to the woman whose doctor is not well informed herein.

"What is meant by dilatation of the heart? Amplification of one or more cavities." The answer is not so clear as the question; dilation is more appropriate than amplification. "What is pericarditis? Inflammation of the pericardium." "What is glossitis? Inflammation of the tongue." "What is amputation? The operation of cutting off a limb," etc. Many such questions and answers occupy space which should be devoted to better use, being no more edifying than the following: If you eat two apples do you not eat a couple? Yes.

Dr. L. asks: "How has yellow fever been divided? Into three varieties, the fatal, severe and mild." These divisions, and their differential diagnosis which follow, are not very edifying. Colic, or a fight with a "Plug-Ugly" might be fatal or mild. "What are the causes of yellow fever? A union of local emanation, favored by an inquinated atmosphere. What are the pathological" [anatomical] "characters of this disease? The most striking are morbid alterations of the liver, it being *pulpy, soft, yellow like rotten cork.* Is the spleen affected? Yes; it has been found altered similarly to the liver." No part of this enumeration has any foundation in the yellow fever subjects of New Orleans, excepting the color of the liver, which sometimes is yellowish or cork-colored, but generally so slightly as not to be admitted at all by many observers.

"What are [is] meant by *subjective* and *objective* sensation? By the former, we mean those sensations by stimulus originating in the body itself, especially if it act rather on the intermediate than on the peripheral part of the sensitive apparatus. By the latter, those where the stimulus is derived from without." A *sensation* which is objective or from without is a contradiction. All sensation consists in the being felt; when not felt, it is not. Sensation is always subjective, whether its cause be within or come from without. A mental state, perception or volition, may cause sensation; an external agent or impression may cause, not feel, not be a sensation. Light is not a sensation but a cause of it; thunder is not a sensation; an odor is not sensation, the amputating knife is not an "*objective* sensation," all of these are purely *objective* minus the sensation.

The author speaks of "subjective sensations produced by external pressure upon the nerves," (277) which contradicts his definition (275) in which he says "objective sensations are those where the stimulus is derived from without." Some conditions of disease are purely subjective, as affections of the mind, also pains in various organs which present no symptoms, that is no objectivity to a second person; nay the patient may have violent subjective conditions, or self cognized symptoms, while his objective symptoms are in absolute contradiction. His subjective state in cholera is that of a burning heat; his objective state is that of icy coldness; his subjectivity in intermittent may be that of severe coldness; his objectivity may be that of great heat, as tested by the thermometer.

Insanity is in a great degree subjective in some of its most incurable forms, and only becomes objective when it presents morbid, obvious phenomena.

Whatsoever feeling is proper to the individual alone is subjective whether it originate in the mental frame or be excited from the objective world through the medium of the senses. In a word, all the personality, its states of feeling, its knowledge, is subjective; all else is objective. There are strictly speaking but two sciences, namely, the subjective and the objective, the in-being and the out-being kingdoms.

How to get from the subjective world within, to the objective world without, by means of intermediate or representational films, phantasms, ideas and transmitted impressions, have, from Aristotle to the present, occupied physiologists, who, distrusting common sense and directly felt intuitions, have constructed numerous routes, and locomotive impressions, and have introduced explanations which have no effect but to make that which was self-evident, incomprehensible, insomuch that a rigid logic would force them to accept the legitimate and unanswerable deduction from these premises, which the great philosopher and good Bishop Berkeley drew, namely, that there is no proof of the existence of a material world, since the mind can know nothing but impressions in the sensorium.

Dr. Ludlow has, of course, given the student questions and answers in relation to the so called discoveries of the sensori-volitional, and excitomotory anatomy and physiology of the nerves. It is remarkable that of late the reputed discoverers in the anatomy of the nervous system appear to have a method peculiar to themselves, diametrically contrary to the fundamental principles of discovery recognized in all other sciences, in which the accepted maxim is, he alone discovers who proves. "To conjecture is easy: the difficulty is to conjecture rightly, and to show your conjecture to be true. It is owing to this itch of divination that scarce a discovery can be made but a prior claimant is brought into view; for when a cloud of arrows are shot in the dark, chance may direct one or two to the target. *But never did Paley say a truer thing than that* HE ALONE DISCOVERS WHO PROVES."—(*Lon. Quar. Rev.*, 1849.)

Neither the idea nor the fact that the cow-pox is a preventive of the small-pox is due to Jenner, as he heard this from the cow milkers, yet, he is justly entitled to the honor of the discovery, because he investigated, verified, introduced, and published the discovery. The same may be said of Harvey's discovery of the circulation—of Franklin's discovery of the identity of lightning and electricity—of electrical telegraphs, as the old French encyclopædists, long before Morse, Cooke, and Wheatstone had advanced the idea—so of the utilitarian uses of steam by Dr. Darwin, who during the last century, long before Fulton or Watt, in one of his poems describes the steam car or locomotive engine and steamboat as if he were now living.

Dr. Darwin (Anno 1793) says:

> "Soon shall thy arm unconquered steam, afar
> Drag the slow barge, or draw the rapid car.
> Or on wide-waving wings expanded bear
> The flying chariot through the fields of air."

The flying steam chariot or balloon is not yet completed. It may be the sequel to the Atlantic submarine telegraph.

History shows that Bouillaud had announced before Newton proved the greatest of all discoveries, namely, the law of gravitation in the planetary system, and that "the intensity of gravitation would vary inversely to the square of the distance from the attracting body," etc.

Laënnee will lose the credit of auscultation—the discoverers of anæsthesia will give place to the poets who had a "river of Lethe, whereof who drinks forthwith forgets pleasure and pain;" the shades took a draught (the moderns smell only) of its waters before entering on the joys of elysium, to obliterate even the memory of their earthly sufferings, such as result from surgical operations, and the like.

Now if the imagining or the naming be *ipso facto* discovery, as some neurologists pretend, it will follow that nearly all discoveries have been made thousands of times before the historically recognized discoverers were born.

To assume the anatomy of the nerves, and then to assume on this basis, a complex system of physiology, can in no case constitute a valid discovery, much less can a compound of incomprehensible, barbarous Greek or Choctaw, justly claim to be so designated. Nor is the naming of a mere hypothesis, *ipso facto*, any nigher the mark. Neither in the abstract nor the concrete can any discovery be thus made. In anatomy, those who adopt this method, or acquiesce in its validity, are no friends to the experimental philosophy, and should be ranked with the dialecticians who raged in the eleventh and twelfth centuries, the Nominalists and Realists, who wrangled for and against the potency, function and universality of names and ideas; whether these were true entities, had souls, or were only *flatus* ?

If students are to be examined in regard to these inconceivable abstractions, Dr. Ludlow ought in his next edition to furnish the following answer: Professors! You never showed us the sensorium, nor the two kinds of sensory nerves, (the ascending and the descending) nor the volitional nerves, nor the excitor nerves, nor the motor nerves, nor the secretor nerves, nor the excretor nerves; nor did you ever demonstrate to our senses traveling impressions. We could not swear in a court of justice, nor in the temple of Æsculapius to their existence, so help us God. Wherefore, pity and excuse us, lest we, your humble servants, bear false testimony and perjure ourselves, seeing that we know, though imperfectly, only one kind of nerves. We cannot bear false testimony in anatomy any more than we can in the ordinary affairs of life. *Falsus in uno, falsus in omnibus.*—Editor.

Rev. II.—1. *The Physiological Anatomy and Physiology of Man.* By Robert Bentley Todd, M. D., F. R. S.; Fellow of the College of Physicians, and Physician to King's College Hospital; and William Bowman, F. R. S., Fellow of the College of Surgeons; Surgeon to King's College Hospital and the Royal London Ophthalmic Hospital; late Professor of Physiology and General and Morbid Anatomy. Complete in one volume, with 298 illustrations. Pp. 926, large 8vo. Philadelphia: Blanchard & Lea, 1857.

2. *Manual of Physiology.* By William Senhouse Kirkes, M. D., Fellow of the Royal College of Physicians; Assistant Physician to, and Lecturer on Botany and Vegetable Physiology at, St. Bartholomew's Hospital. A new and revised American, from the last London edition, with 200 illustrations. Pp. 584, 12mo. Philadelphia: Blanchard & Lea, 1857.

In the medical sciences generally, and particularly in physiological anatomy, the student should, other things being equal, prefer works which are based on experimental researches made by the authors themselves. Such works even when they contain nothing absolutely new or original, possess, nevertheless, paramount claims over mere compilations. The medical sciences require to be investigated and reïnvestigated, tested and tested again, enlarged and generalized, for the purpose of obtaining greater certainty and universality. It is very desirable to find out that the hundredth trial or repetition, has confirmed the ninety-nine which preceded.

The Physiological Anatomy of Professors Todd and Bowman, in a great degree, rests its claim to acceptance upon an experimental basis. The authors say, "We aimed at resting our anatomical descriptions, at least as it regards the more important points, upon our own investigations, and at repeating former experiments, or devising new ones, whenever questions of sufficient interest presented themselves. While we humbly confess how small have been the advances attributable to our own labors, the immense extension given to the sciences of anatomy and physiology during the last fifteen years, may be admitted as some explanation of the delay that has occurred in the publication of the work, a delay that has been a constant source of regret to us, since we began to discover how impossible it would be for us to complete it within the term originally contemplated."

Experimental investigation, how good soever it may be in itself as the means of scientific deduction, is, in incompetent hands, liable to great abuse and may be prostituted to the purposes of a biased, uncandid mind bent upon upholding a favorite hypothesis. Such an experimenter, by moulding and arraying ill-understood, *ex parte*, or perverted facts, by omitting or undervaluing whatsoever has an import contrariwise to his wishes, becomes a more dangerous guide than the utopian system builder whose imagination supplies the place of laborious experimentation.

Professors Todd and Bowman in the work under consideration, have with equal candor and ability steered clear of the whirlpool of Charybdis and the rock of Scylla, that is to say, the whirlpool of heterogeneous facts and the rock of dogmatism.

In perusing this work, a certain class of readers may ask, are the claims of these authors to be estimated by the amount of their original experiments? or have they simply verified the experiments of others? and to what extent? or does their chief merit consist in their sound judgment in appreciating the experimental contributions of others? Perhaps these authors believed (what indeed is very probable) that a vast proportion of medical men as well as the public, care not much for processes, but for results only. Nevertheless, it is of great importance to the rigid logician, as also to the sceptic, to know the precise methods of procedure in the building of an experimental book—a towering pyramid of learning. The number and nature of the experiments in chemistry, vivisections, etc., as well the opinions and conclusions predicated upon the phenomena enumerated, is important to the student who may wish to verify, estimate, modify, adopt, or reject for himself. A certain degree of unrest not to say scepticism, in connection with the ceaseless efforts to compass new truths and to eliminate fundamental principles in medical science, must ever characterize the philosophizings of the most competent experimentalist, until he can say with satisfaction to himself, I have experienced much and long. So far there is no exception to this law or that principle. The ground on which I had rested some opinions formerly, has been washed away by the waves of successive experiments. But how meanly soever my hut may be, I build upon the rock, and gather, as Newton did, some pebbles while the great ocean of truth lies before me almost unexplored.

With Cullen, Brown, and Broussais, theoretical medicine ceased almost entirely, that is, no general theory of theirs or of their successors of the present generation, reigns supreme. For homœopathy, hydropathy, Thompsonianism, etc., no more than tranceism or spiritualism can, with any propriety, claim to be sound theories.

Observation, experiment and their rational interpretation, classification and deduction, the surest routes to the truth, illustrate and establish sundry leading principles, none of which rise into absolute universality, so as to form a complete general theory of medicine. Some of the old theories have, indeed, been found applicable to certain groups of phenomena, and have rendered good service in accounting for many facts.

Thus the humoral and other theories, now estimated at their proper or approximative value, were formerly, in many respects, overrated or underrated. Chemical, physiological, anatomical, and pathological research and discovery have afforded the material for a better appreciation of theories.

In this interrogation of nature, the narrow limits of the human understanding, and the vast range of possible error, render the numerical method of investigation, of inestimable value in medicine. By this method, probability, varying from zero to an almost absolute certainty, may be estimated in practical matters of the utmost concernment to health, limb, and life.

The theoretical *interregnum* which now exists or is filled up with voluminous and able works, particularly such as treat of physiology (Dunglison, Carpenter, Todd and Bowman, etc.,) is a favorable circumstance for true science. Theories are virtually things, and very serious things too. The four cardinal humors of Hippocrates, Bile, Atrabile, Blood, and Phlegm, Van Helmot's immaterial gaseous, intelligent principle, the Archæus; Stahl's Anima, or living spirit; Boerhaave's *Lentor* and *Error loci*; Cullen's Spasm; Brown's Stimulus, Excitability, Sthenia and Asthenia; Broussais' Broussaisism, and Expectationism—all these, and many other apparent abstractions, have tyrannized over the human economy and its many organs: that is, these theories have commanded in the battle against the whole army of maladies, and have directed every therapeutic movement. Flying grape, cannister, and bombshells are not, for instance, more real, than were Cook's pills, twenty years ago, in the valley of the Mississippi for the relief of the congestion of the vena cava and its branches! The theory died during the life-time of its learned author, who lately descended to the tomb.

The comparatively modern opinion, which daily grows stronger, that Physiology is a most reliable guide to pathology and therapeutics, being well founded, it is of great importance that the physician should inform himself thoroughly in the fundamental principles, details, and constant progress of this science, which he cannot do without reading the new works upon this department of knowledge, and the more so, should he not devote himself to its laborious experimental investigations upon the inferior animals, in connection with the morbid phenomena which he witnesses in attendance upon the sick.

There is an earnest, it may be an able, class of practical men who listen with incredulity, perhaps with aversion, or even with indignation, to this *Io triumphe!* in favor of medical progress. They admit that physiology, pathological chemistry, micrology, physical diagnosis, surgery, and pathological anatomy, have advanced or are advancing towards perfection. They affirm, and with much truth, that therapeutical certainty, or the curing of the sick, has not advanced with equal step as compared with other branches of medicine. The cure! the cure! tell us that! If, however, therapeutical treatment has not kept pace with the knowledge of the diagnosis, the seat, and the anatomical characters of disease, it is, nevertheless, very evident that this latter kind of knowledge is, at the very least, the only reliable basis for any rational treatment which exists or which may be discovered hereafter. If the dream of therapeutists concerning a panacea for each disease should ever become a reality, the medical sciences alluded to, will be the guides to a just and discriminating diagnosis, without which, even a specific cannot be applied rationally and successfully.

It is not within the narrow scope of these remarks to review, in detail, at present, the learned and useful work of Professors Todd and Bowman on the Physiological Anatomy of Man, now completed and published in a large volume abundantly illustrated—a book imbued with the Hallerian and Baconian spirit of the inductive philosophy, and one very likely to prove attractive to men of education and philosophers beyond the pale of the medical profession. It is a magnificent contribution to British medicine, and the American physician who shall fail to peruse it, will have failed to read one of the most instructive books of the nineteenth century.

The limits of this journal will not allow of the insertion of the notes which had beeu written on several chapters of this work—a book the greater portion of which had been so long before the profession stamped with its *imprimatur*, that there can be no more need to dwell upon its merits than upon the merits of Dunglison, Carpenter and others, whose works have beeu thoroughly appreciated and can only become obsolete by the farther progress of discovery.

Of the second work designated at the head of this article, namely, the Manual of Physiology, by Dr. William Senhouse Kirkes, of London, with additions by Dr. J. Aitkin Meigs, of Philadelphia, it may be truly said that, for its magnitude, it has no rival.—EDITOR.

REV. III.—*L'Afrique Médicale. Gazette Médicale de l'Algérie. Janvier, Février, Mars, et Juillet, 2me année. (Ce journal parait chaque mois.) Rédacteur en chef, le Docteur A. Bertherand, médicin principal à l'armée d'Afrique, etc.*

WHEN we contemplate the science of medicine in connection with the varied conditions and interests of our species, whether in so doing we direct our attention to the social, the religious, the moral, the scientific, the belligerent, or the æsthetical, we cannot fail to be struck with the intimate and necessary relations which constantly present themselves. In such contemplation but little is seen which cannot be made to wear its medical aspect without either straiuing or distortion. The little and the great—the revolutions of the polka and the waltz, as well as those revolutions which bring forth fugitive patriots and headless kings, have all their physiology, pathology, therapeutics, hygiene and other medical relations. Wherever man exists, the legitimate jurisdiction of the physician is, *ipso facto*, established. His mission is well indicated by that noble apothegm of the poet; *Homo sum, et humani a me nihil alienum puto.*

The numbers of the journal above indicated, and which are now lying on our table, call forcibly to our mind the relation existing between the progress of medicine and the march of war and conquest. Mars is no longer the implacable ruffian of his early days; but affects the company of the mercifully disposed, and to this end he is seen marching hand in hand with Æsculapius, the powder and ball of the former only preparing the way for the powder and pill of the latter.

As medical journalists we pray daily that we may never wander out of our legitimate field, which is large enough in all conscience. We hope we may never be so presumptuous as to take it on ourselves—without good and sufficient professional reasons—to teach statesmen, politicians, generals, judges, or ecclesiastics, either what they should do, or what they should leave undone. It cannot, therefore be expected that we should have a word to say either for or against the system of annexation, conquest, aggrandizement, filibusterism—which finds favor, and which has ever found favor with powerful nations—save only in so far as that system may be found to affect the progress and condition of medicine. In relation to the conquest of Algeria we would not wander from our path. We leave it to a great and polished nation to glory in its extension of territory; we leave it to the commerce of the Mediterranean to rejoice at the downfall of the pirate; we leave it to the benign soldier of the Cross to return thanks that the False Prophet has been discomfitted in one of his strong holds; let the law boast of the *Code Napoleon* to the exclusion of the mystic rhapsodies of the Koran; let all exult or lament as they may find it meet; but as for ourselves, holding communion as we now do, with our *cher et très honoré confrère M. le Docteur A. Bertherand*, we feel quite free to say, that so far as the interests of our great medical confraternity are concerned, we are heartily glad that the Dey of Algiers has had his day. It is refreshing to hail from the *ci-devant* pirate-land, a first class medical monthly speaking in the language of Corneille and Racine, the truths of our noble science. Speaking as a physician, therefore, we do not begrudge our ancient ally her acquisition of territory however much we may, as an American, feel pinched ourselves for territorial elbow-room, hedged in as our people are by oceans east and west, and neighbors north and south.

But we give up the questions of conquest and territorial aggrandizement as questions of public policy and justice to those to whom they properly belong. It appears not unlikely that a few powerful nations of Christendom may ultimately render themselves masters of the world notwithstanding their merely *theoretical* horror at the idea. Practically, the necessity appears to exist. Waiving the consideration of the premises, however, save only in a medical point of view, we have no hesitation in saying that it were eminently for the benefit of our science, that the mastery should be realized as speedily as possible. Till legitimate medicine shall have reared her head in all parts of the habitable globe, and spoken the truths which grow out of faithful observation and experiment, we must ever remain ignorant of many of the very elements which properly belong to our science, and fundamental errors are likely to be handed down from generation to generation without the means of correction.

Let us take, for instance, the subject of epidemics, in relation to which there are many fundamental points, which—if ever indeed they admit of explanation at all—can only be elucidated by an almost world-wide series of local observations. The good service done to the cause of our science in Algeria, should prevent us from lamenting, should the nation which now controls that country help itself to the whole of North Africa, from Morocco to Egypt, and send the native rulers to France on the same mission as was amply fulfilled by Abd-el-Kader himself.

We refer our readers to the Med. and Surg. Jour., for November, 1855, in which will be found a translated notice of two able, curious, and interesting works on Medical Algeria, the one by Dr. A. Armand, and the other by Dr. E. L. Bertherand.

The numbers of the *Gazette* before us are replete with highly interesting local matter, illustrative of the meteorology, diseases, etc., of the country, giving the monthly bills of mortality of the city of Algiers, with detail of age, sex, nationality, disease, etc. We had marked out some interesting extracts and statistics for insertion in this Journal; but space is at present wanting. M. Morton Dowler, M. D.

Rev. IV.—*Status of this Journal.*

To the Patrons of The New Orleans Medical and Surgical Journal, *salutem in Æsculapio.*—Suddenly—as the parting of the Atlantic cable—Messrs. D. C. Jenkins & Co. parted from their connection with this Journal. It is believed accidental circumstances rather than choice, determined them originally to become its proprietors, and its transfer to others had the editor's sanction.

On the second day of September, which inaugurates a new era in the editorial department and proprietorship of the Journal, Doctors Warren Stone, James Jones, and Stanford Chaillé purchased its subscription list together with its entire assets. At the same time, its proprietors—henceforth co-editors—passed an act before a Notary, forming a permanent company, whose objects are to enhance the scientific value and claims of the Journal, to augment the number of its scientific contributors, to extend its usefulness, and to improve as far as possible its typographical execution, etc. The conduct of the incoming editors towards the present editor was, of course, just. But it was more.

It was kind. They wished to retain his services, and contracted for them accordingly, until May, 1860, without, it may be, rigidly looking to their own pecuniary gain.

These movements chiefly concern another party, namely, the patrons of the Journal, who are the breath of life in the nostrils of journalism.

In future, the subscribers (who can at once snuff out the brightest editorial lights in the land) will receive services greater in number, weight and value than heretofore.

The incoming editors for conceded ability and extensive experience in practical medicine, surgery, etc., stand on as high a level as the highest. They enter upon this enterprise, *con amore*, with a wish and a will to enhance the value of the Journal, and to emulate, if they can not excel, their honorable rivals in journalism in this and other lands.

This Journal, now advanced into its second decennium, is the depository of many able contributions by hands that have "lost their cunning." But Carpenter, Harrison, Hort, Hester, and others live and speak in its pages. The Pagan sages held as a maxim, that life without letters is death. Is there one subscriber to this Journal who cannot contribute some useful fact or paper? If the love of fame is not a sufficient motive for the scientific laborer, the desire to be useful is. He who has been benefited by the writings of others, should in return contribute in like manner. On reviewing several years of journalistic life and experience, it appears to the editor that his relations to the patrons of this Journal (with nineteen twentieths of whom he has not the honor of a personal acquaintance) have been, so far as he can judge, altogether agreeable, at least to him. Editorial errors, prejudices and short comings seem to have been passed over silently—perhaps forgiven. There is, however, one unwelcome *souvenir* which rises like Banquo's ghost, that is the leger-book of this Journal, which is said to show the ghastly figures of an enormous and constantly increasing debt due from subscribers. Although the editor has neither now nor prospectively, even the remotest pecuniary interest in either the losses, gains or revenues of the Journal, yet it is to him a source of regret that his labors and influence have been too poor and insufficient to impel or pursuade the consciences of numerous readers to make a just and prompt compensation to the proprietors. It seems that the indefinite postponement of payment for periodicals is becoming the rule, not the exception. This is the *vis inertia* which represses literary enterprise and virtually fetters the hands of the cultivators of science. If payment has been withheld from this Journal upon the principle *poor editor, poor pay*, that demurrer or plea will not be admissible after the kalends of November, *anno* 1857.

EDITOR.

THE NEW ORLEANS

MEDICAL AND SURGICAL JOURNAL

FOR NOVEMBER, 1857.

ORIGINAL COMMUNICATIONS.

Art. I.—*The Treatment of Pulmonary Consumption:* By Samuel A. Cartwright, M. D.

There is an intimate connection between respiration and assimilation, which should never be lost sight of in the treatment of consumption. However good the appetite and digestion may be, unless there be a free ingress and egress of the atmosphere into the air-cells, the patient will emaciate. What is called *dulness* is an absence of the vesicular murmur; but bronchial respiration, voice and cough, clearly indicate structural disease or great obstruction in the tubes leading to the cells. Although the respiration may be feeble or loud, it is imperfect in proportion as the air is excluded from the cells. It is vesicular respiration which is associated with assimilation as cause and effect. The vapor, from boiling cane juice, is a very effective means to clear the tubes, leading to the air-cells, when obstructed by tenacious secretions, pellets of mucus, or contracted from irritation and a thickening of their lining membrane. The free play, tone and activity of the involuntary muscles expanding the chest, is as essential to perfect respiration as an open state of the air tubes. If the vital involuntary power, which keeps in perpetual motion the respiratory apparatus, be too feeble to expand the chest sufficiently, imperfect assimilation will be the consequence. In addition to the perpetual exercise of the involuntary muscles, the occasional exercise of the voluntary to assist the involuntary in expanding the chest, and to give activity to the circulation of the blood, is also requisite. Violent exercise, or any thing which exhausts the vital powers by producing fatigue, is objectionable, as it also exhausts the power which keeps in activity the involuntary muscles. Forced breathing through a tube or in any other manner, except for a short time to remove some temporary obstruction to the passage of the air into the cells, is not advisable from the fatigue and muscular exhaustion it occasions. The lungs must be expanded, but they had better be expanded by giving activity and free play to the involuntary muscular apparatus. The involuntary muscles never tire or flag in their action, while supplied with their appropriate stimuli. Whereas the voluntary soon tire and cease to respond to stimuli or to obey the will until after they have rested awhile. Horse back exercise is very favorable to a free play of the involuntary muscles concerned in respiration, and at the same time assists the process by calling into action a large number of the voluntary muscles without fatiguing them. The involuntary muscles, although removed from the empire of the will, nevertheless respond to psychical influences, and perform their unremitting labor with more or less activity and energy according as those influences may be depressing or exciting. Whatever expands the mind links it with external objects, and awakens into activity all its dormant powers, gives increased energy to the involuntary muscular forces moving the thorax, and makes the respiration more perfect. On the other hand, whatever depresses the mind, drives it in upon itself, lulls it to sleep and shuts it out from the stern realities of real life, tends directly to diminish the energy of the involuntary muscular forces of the respiratory apparatus, and thereby causes the respiration to be too imperfect for the required arterialization of the blood and for the proper assimilation of the nutritious juices furnished by the digestive system. The nostrils involuntarily dilate and the chest expands when the mind is awakened and struggling to take an active part in the exciting scenes of the world without. More air is taken into the lungs, as if to feed the awakened mind, and to give it more power to struggle against opposing forces. But when driven in upon itself by fear, grief and despair, or left to languish in the lap of ease and sloth, or coaxed out of the real world by fancy reading to dream in a vain imaginary one, the lungs almost cease to play and the heart beats with less force and energy.

As psychical influences enervate or strengthen the dynamism of the respiratory process, they cause, cure or prevent consumption according to the action they produce on the nervous system. Mere physical means will not cure consumption, because the disease is radicated in an enervation of the involuntary muscular system, and has a constant tendency to feed itself, by reason of the defective respiratory movement, causing defective assimilation, and thereby increasing the enervation.

The motive power of the respiratory and circulatory apparatus is muscular. Whatever question there may be in regard to the power of that immaterial essence, called the mind, over other forms of matter, there is no question of its power to move that material substance, called muscle. As far as the voluntary muscles are concerned, the will, an immaterial attribute of the immaterial mind, is almost their only motive power. The involuntary muscles, although not under the influence of the will, are nevertheless influenced by other attributes of the mind. Fear acts as a sedative upon them, and joy as a stimulant. In the disease, called consumption, mere physical agencies are insufficient to impart to the involuntary muscular system, on which the vital function of respiration depends, sufficient energy to maintain its integrity. Hence the necessity of calling in the aid of psychical means to give energy to the involuntary muscular apparatus which moves the thorax and heart. To effect this desirable purpose, all the faculties and powers of the mind should be awakened and kept in a state of tension.

We have no woods now, as the early pioneers had, filled with hostile Indians to keep the mind awake, and in a constant state of tension to guard against their wiles; no wars, as that of the Revolution, to bring into play all the mental powers, and thereby to effect cures of consumption, as in the days of Rush. But when the principle, or *modus operandi* of psychical influences, is understood, there are a thousand other ways by which the intelligent physician can call thém to his aid to assist him in combatting with that fell destroyer of the human race—pulmonary consumption.

That psychical influences are all-powerful, both in the prevention and cure of the disease, there is abundant evidence, (besides that adduced by Rush in the Revolution,) to be found in the history of the pioneers of our western and southern wilderness. It is well known, that among the early pioneers, pulmonary consumption was almost unknown. If not actually cured, it was at least prevented. When I first commenced practice in the Alabama territory, before its admission as a State, I would have fallen into the error of believing that moving south prevented consumption, (so rare was the disease among the early settlers,) if I had not previously visited the northern and western frontier and found the same remarkable exemption among the pioneers of that region. This exemption is often attributed, by those unacquainted with the entire history of our backwoodsmen, to their being, *ab origine*, a healthier, hardier class of people than their kindred in the old States or their descendants in the new. But as far as my observation extends, they were, as a class, less healthy and vigorous, when they left their homes in the Atlantic States, than the people they left behind them. A more squalid, sallow, unhealthy, consumptive looking people, (a large portion barking with a cough,) than those that constituted the emigrant trains that were daily seen slowly wending their way to the far West and South, could with difficulty be found among the inhabitants of the old States who remained at home. The poorer classes emigrated, not the richer. The former were the more unhealthy of the two. They were mostly tenants and not proprietors of the soil, and generally occupied more unhealthy localities than their landlords, who would naturally choose the healthier places for their own family residences. Where the emigrating tenants did not dwell on the sickly water courses, but on healthy hills remote from them, the land was, in most instances, so poor, (I speak from personal observation of eastern Virginia,) as not to afford enough to pay their rents and to leave them in possession of sufficient means to purchase the comforts of life, required to preserve their health. It is very true that the pale, sallow, consumptive looking men and women, and wormy children, who constituted the larger portion of the emigrants from the malarious districts and the worn out old fields of the Atlantic States, speedily became the hardy, bold and adventurous pioneers of the western and southern wilderness. It was not the mere exercise in traveling, which produced the wonderful metamorphosis, but the increased energy imparted to the respiratory organism and the circulation, when the involuntary muscular frame work was made to feel a new dynamic force, strong and inexhaustible, generated by an awakened mind. Nothing was better calculated to awaken every mental faculty and to keep the mind in a constant state of vigilance and attention to surrounding objects, than the dangers from the Indians and wild beasts and the necessity imposed on the pioneers of providing food, raiment and shelter for themselves and families in a howling wilderness, beyond the boundaries of civilization. Under such excitement of the mind and nervous system, they were constantly growing in physical strength and intellectual energy, from the time they left their homes in the old States, until they had subdued the wilderness, driven off the savages and found themselves lords and masters of fertile farms in the southern and western territories. Until then they had no consumption among them. Those who had commenced their journey with a cough, found that it left them, as did enlarged spleens, protuberant abdomens and swollen glands, without knowing the reason why—or why, as the abdominal viscera became smaller, the muscles of the body and limbs became larger, firmer, and stronger. Many of them attributed the change to the use of fat bear meat as a diet. Fat bear meat is, no doubt a better incrassent than cod liver oil, being easier of digestion and more nutritious, but its use as a diet was not general, and is insufficient to account for the phenomena.

It is well known that the muscles swell, the nostrils dilate, the chest involuntarily expands, and soldiers grow larger in body under the excitement of mind caused by the sound of the war bugle and the roll of the drum; but it should not be forgotten, that every thing which awakens the spirit within, to make its tenement of clay take an active part in the exciting scenes of the world around, brings into action an additional dynamic force, gives strength and energy to the muscular mechanism on which the circulation and respiration depend; and this psychical influence has only to be invoked, to become a powerful remedial agent in the cure and prevention of consumption. It is more available in that class of consumptive patients whose minds are originally strong and active, and whose bodily organizations present the best specimens of the finer and more delicate forms of material structure—having fair complexions, thin, smooth skins—countenances illuminated under excitement, and varying like changeable silk with every passion and emotion of the mind. But this is the very class of persons most liable to the disease. They are the very class of persons whom a wise Providence seemed to have designed as chosen instruments in the work of reforming and bettering the condition of mankind, and to lead the way in human progress. Hence they have imposed upon them the penalty of pulmonary consumption for not fulfilling their high destiny. They must be active and take a leading part in the active duties of life, and mingle in the exciting scenes of the world or die with phthisis. Born to command and to conquer nature, the will is strong, from the voluntary system predominating over the involuntary, to a higher degree than in the opposite classes of the human race with weak wills, feeble intellectual capacities and coarse bodily organizations. The latter, physically constituted to be led and governed by the more intellectual class, may sink down into sloth and inactivity of body and mind with but little risk or danger from consumption; because their involuntary muscular systems, as in the brute creation, are sufficiently strong to carry on the circulation of the blood and the respiratory process without any aid from the mind. Whereas with the highly intellectual portion of mankind, intellectuality is itself a necessary stimulant to the healthy performance of the functions of organic life. So weak and imperfect are the organic actions in intellectual children, they are apt to die before puberty, or to perish with consumption soon afterwards, unless the pent up mind within is awakened, expanded and put in relation with the external world, or let out into it, as it were, by a proper system of physical education. With them, organic life languishes under abstract studies, want of exercise and confinement from the open air and light; for the plain reason, that being originally feeble, it requires the aid of psychical influences to keep it in sufficient activity for a due performance of those organic functions—respiration, the circulation, digestion and assimilation. Under that stimulus to organic life, the body daily grows more and more symmetrical, and the disproportion, observed in intellectual children, between the head and limbs—the nerves and muscular systems—the glandular and respiratory becomes less; and the tendency for one hip or shoulder, or one half the body to outgrow the other, so often observed in intellectual children and in consumptive patients, disappears.

The history of the pioneers, at least a large portion of those who emigrated from Virginia, Maryland and the Carolinas, if ever correctly written, would teach many useful lessons in regard to physical education and the best means to arrest and prevent consumption. Although mostly poor, uneducated, improvident, sallow and sickly, no better blood circulated in the veins of any of the human species than in theirs. They inherited the fine organization and the sanguinio-nervous temperament of their ancestors, the cavaliers. Their fathers and grand-fathers were the heroes of the Revolution, and devoted their time, talents, lives and fortunes to the grand work of achieving American Independence, leaving them, their descendants, in most instances, in poverty and without the means of acquiring an education. Monotonous labor afflicted those with rheumatism whose progenitors were gouty, while sedentary employment or an inactive life cut them off with consumption or deformed them with glandular affections and visceral engorgements. Their minds, naturally strong and expansive, made them restless and discontented with their condition as tenants and dependants, and created a desire for mental excitement in the novelty, dangers and hardships of life in the wilderness. Instead of being appalled and kept at home, as any other people of weak, timid, selfish minds would have been, by the dreadful stories of Indian depredations in way-laying, shooting, tomahawking, scalping and torturing men, women and children on the frontier settlements; such stories only fired them with an irrepressible desire to hasten to scenes where the danger was the greatest. They made their exodus from the old States in families, or separate and detached parties, as the spirit moved them, without much system or military organization, each emigrant train acting for itself independent of any others, being its own pilot and providing its own arms and equipments, and each encumbered with a goodly number of helpless women and children, who could not be left behind, as they had no one to provide for them. Hence they shared the dangers with their husbands, fathers and brothers. From the time of their departure until they had conquered the Indians and planted civilization in the wilderness, their bodies and minds were daily receiving the many inestimable blessings, which nothing but a good physical education can so well bestow. Physical education not only strengthens the body and fortifies it against morbid influences, but it expands the mind, exalts the senses and awakens the observant faculties. So much was this the case with the pioneers, that not a leaf rustled or a twig cracked in the woods and cane brakes around them, escaped their notice. The same psychial and physical influences, which gave sharpness to the sight, acuteness to the ear, steadiness to the hand in levelling the rifle, and strength to the muscles in grappling with the savage, gave increase energy to the functions of respiration, assimilation and digestion; thereby casting out of the body the seeds of disease, and converting the pallid, soft and feeble emigrant into the hale, hardy, healthy backwoodsman.

While the history of the early pioneers tells how consumption may be prevented and even cured, the history of some of their descendants tells what will cause it and make it incurable. It tells, that an unprofitable life of indolence and ease, with the mind caged from the real world, and fed on vain abstractions mistaken for true science, and novel reading for literature, will as certainly cause consumption and give it the character of an epidemic, as heat and miasm the intermittent fever. In a word, whatever tends to diminish the dynamic forces of the involuntary respiratory muscles, or to exclude the atmospheric air from the cells of the lungs, predisposes to the deposition of tuberculous matter; on the other hand, whatever tends to invigorate those forces and to keep the air tubes open; prevents such depositions from forming, and from softening after they have formed. The cold, dry, dense atmosphere of a hyperborean region, acts as a powerful stimulus on the muscular system generally, as proved by the proverbial industry and activity of the northern people. The involuntary, no less than the voluntary muscular system, receives increased power from a cold, dense atmosphere. Such an atmosphere penetrates obstructed air tubes, that a rarified, warm and humid air could not open. A cold climate, in winter, is particularly beneficial for that class of consumptive patients mostly found in warm latitudes and in malarious districts, who have a sallow, dingy complexion, feeble circulation, cold feet; complain of a disagreeable sensation of chilliness, and a liability to take cold from any sudden change of temperature or the least exposure to the weather. The greater amount of oxygen inhaled, in a cold, dense atmosphere, vivifies the blood more effectually, and sends it to the periphery of the body, where it acts as a capillary stimulus, warms the extremities and removes chilliness. Whereas, for that class of patients who have fair skins, bright, clear complexions, hot hands and feet, and an irritable condition of the lungs from an active circulation, a warm, moist climate, or even a malarious locality, is the better, until a derivation to the abdominal viscera occurs—known by a sallow hue and the waist increasing in circumference.

When the respiration of cold air constricts the bronchial tubes, excluding the air from the cells, or when the tubes themselves are obstructed with tenacious bronchial secretions or pellets of mucus, the respiration of the vapor arising from boiling cane juice affords a speedy and effectual remedy. In all cases in which vesicular respiration is imperfect, assimilation will also be imperfect, and the patient will emaciate. The biceps and pectoral muscles are the first to diminish, when any cause excludes the required volume of air from the pulmonary cells.

I did not recommend the sugar house for those who have cavities in the lungs, yet so many of that class of patients, in the last softening, hopeless stage of consumption, made an imperfect trial of the remedy, that I would have regretted ever having published the monograph on "the sugar house cure for bronchial, consumptive and dyspeptic complaints," if additional evidence had not accumulated of its beneficial and curative effects, when fairly tried, in the class of cases in which I had recommended it, and of its doing no harm, but often giving temporary relief in some of the hopeless cases in which I had not advised it. But in those sugar houses where the bi-sulphate of lime is used to clarify the juice, the respiration of the vapor is hurtful. The negroes, who are very fond of the juice, and grow fat during the rolling season, will not drink it if the bi-sulphate of lime be used to clarify it.

The great reluctance of the planters to have sick strangers in their sugar houses, during the most busy season of the year, where there is seldom any room for them, is a great obstacle in the way of that method of treatment. The treatment by suction, over and around the chest, will often answer in place of inhalation to remove the irritation and obstruction in the bronchial tubes excluding the air from the cells.

Some degree of suction can be effected by applying compresses around the chest, wrung out of a solution of hydrochlorate of ammonia in water and alcohol, and covering the compresses with an air-tight bandage, made of oil-silk, between folds of cloth. The heat of the body generates a vapor, which being confined by the bandage, creates a partial and very imperfect vacuum, yet sufficient to cause some degree of suction over the entire surface covered by the bandage and the compresses. The compresses should be renewed several times a day—three times at least. They should not be too wet, or the heat of the body will not cause the vapor to be generated. The compresses should be wrung almost dry, and should be made of coarse, porous linen cloth.

The solution of the hydrochlorate of ammonia in alcohol or vinegar, diluted with water, has long been used as a lotion for deeply seated inflammations, pains, sprains and bruises. The officinal lotion of the Pharmacopœia is too irritating to be used in the above manner. An ounce of the officinal lotion with water and alcohol, will be sufficiently strong, when added to a pint of cold water, to wet the compresses in. But if in addition to the suction, it be thought advisable to create counter-irritation by a crop of pustules on the skin, the compresses should be wrung out of a stronger solution and then covered with the oil-silk bandage. The eruption, however, will interfere too soon with the application of the bandage, and of course with the treatment by suction. The benefit, from the latter, is much greater than from counter-irritation. It has all the benficial effects of leeching or cupping, and is not liable to the objection of causing debility. As soon as the compresses are applied, the patient should exercise on horseback for two or three hours. A gentle horse and a slow traveling gait, are to be preferred to fast riding.

Something should be devised, suitable for each particular case, to awaken the observant faculties, to interest the mind with external objects, and to draw it out from inward contemplation into the field of some useful pursuit. Living for an object, or to effect some useful purpose, gives a power to the mechanism of respiration and the organic functions, which life without an object is deprived of. Hence, psychical influences, after all, are the most to be depended upon in the treatment and prevention of consumption.

Art. II.—*Researches into the Natural History of Cholera.* (Continued from the September No.) By Bennet Dowler, M. D.

The precursory or incipient symptoms of cholera, as debility and involuntary twitchings of the muscles, impaired appetite, meteorism, coolness and duskiness of the skin, copious alvine evacuations, quickness of the pulse and the like, are seldom alarming. The differential diagnosis of the whole group of these phenomena is often difficult to appreciate, or distinguish from kindred affections. The diagnostics of cholera are, therefore, usually taken from the advanced or grave form of that malady, attended with excessive purging, algidity, cramps, collapse.

Every physician conversant with cholera, must have observed, that with few exceptions, its natural tendency is deathward. Most physicians consider that to treat symptoms, as they appear, is all that can be done for the patient. Exceptions to this empirical method occur. Thus the algidity of cholera is not amenable to external heat, which is not only unsuccessful, but most repugnant to the patient, who has the subjective without the objective symptoms of fever; warm applications, warm water baths, or warm vapor baths do not restore the heat to the system generally, nor are they easily tolerated by the patient. Sinapisms, however, are probably useful, even though they may scarcely inflame or heat the skin. Are they not revulsive, (being painful) nevertheless?

Can calorifacient medicines reproduce the lost temperature in cholera? Certain medicinal agents can depress or exalt the animal heat under some circumstances. In *L'Union Médicale* for May 24, 1851, is an account of MM. Duméril, Demarquay et Lecointe's experiments, showing the modification of the animal temperature from the introduction of different therapeutic agents into the economy. These physicians associated themselves together for the purpose of making these experiments. M. Demarquay began the investigations as early as 1847. Their experiments were made on dogs. Cantharides administered in doses of 8.20 to 40 centigrammes, elevated the thermometer 2.1° in 6 hours: cannella 30 to 45 grammes, from 1.7° to 2.7°; ergot $\frac{3}{10}$ of a degree in 5 hours. Phosphorous, 10 to 20 centigrammes, caused a depression; strychnine almost no result. Large doses of emetics in 2 hours caused depressions of 2°; subsequently there was a rise of 1°. These degrees of the centigrade, indicate nearly double the temperature of the Fahrenheit scale, being as 1.8° to 1°.

Calorifacients act as such, if at all, through the absorbent and circulatory systems. In cases attended with the suspension or loss of the function of absorption, the action of these agents must be little or nothing.

Laudanum, or the salts of morphia and quinia dissolved in water or in diluted brandy or whisky, form an excellent enema in the early stage of cholera, which may be repeated, if necessary, after every copious evacuation. If this combination be retained, and the function of absorption be not lost, the cholera will generally be arrested, and the development of consecutive fever, which sometimes follows cholera, be prevented. The enema-treatment, as an auxiliary to that by the stomach, is of the utmost importance, because the general impairment or paralysis of the absorbents, renders it important that both extremes of the alimentary canal should be appealed to as seats of medication, and the more so, because the failure may be greater in the stomach than in the large intestine, and *vice versa.*

Whether the tincture and salts of opium arrest serous discharges or choleraïc exosmosis upon the physical principle of a superior edosmotic relation is not very evident. Opiates doubtlessly diminish the exaggerated or morbidly increased peristaltic action of the bowels which characterizes dysentery, diarrhœa, and cholera. I have sometimes found the peristaltic action to persist for hours after death from the latter.

The remedial measures in cholera, concerning the efficacy of which there can be, in general, but little doubt, are few and simple indeed, being scarcely more than three or four, namely, opium, stimulants, water and frictions. Nevertheless, many other remedies are often useful. The preparations of opium, as laudanum or the salts of morphia, surpass all other remedies in the universality of their therapeutic efficacy when administered by skilful hands. The administration of opium or any other potent agent in cholera, is, however, attended with unusual difficulty, as to the strength and repetition of the dose. If the power of absorption be greatly impaired, in connection with frequent vomitings and purgings, the dose may be excessively, and under other conditions dangerously large, and may be often repeated without the toxical effects that might otherwise be expected.

Water, perhaps, should be reckoned as an important if not a principal remedy in the treatment of cholera, although it is often interdicted by the medical attendant, under the apprehension that it increases the tendency to vomit. The patient has an irrepressible desire for it, and this fact alone affords a presumption favorable to its employment. Theoretical considerations are also favorable to this instinctive indication; for, water, which is, perhaps, more readily absorbed than anything else, is adapted to supply the great loss of the watery part of the blood parted through the alimentary canal. How cold, soever, may be the surface, the subjective sensation of heat calls for cold or iced drinks. In wounds attended with rapid and large effusions of blood; in abortions, etc., attended by violent hæmorrhages, thirst becomes violent just as in cholera. In attempts to commit suicide, by which large emissions of blood have taken place, I have noticed that neither the wounds nor the disgust with life, could repress the demand for water. Upon the battle field, it is said, that the wounded, who have bled much, demand, above all things, water. In cholera, thirst constitutes the substance of the patient's misery or complainings.

The natural appetite for food and drinks should generally be gratified during sickness. Ice, which has a better claim to a place in the Materia Medica than many articles already in it, was, in former times, not allowed to yellow fever patients by the faculty, and was prohibited by authority, the mayor of New Orleans having issued his proclamation closing all the ice-houses during an epidemic!

Friction is the most effectual means yet discovered for the removal of the grievous cramps which assail the exterior of the body and the limbs. The dense, knotty, painful masses of the muscular tissue, characterizing cramps, yield, in many cases, to this treatment, which the patient calls for instinctively, as he does for water when thirsty. This mechanical treatment of cramps, how inexplicable soever it may be, is, in many cases, attended with marked relief. Half a dozen of assistants may sometimes usefully employ themselves in allaying these muscular spasms.

In a speculative point of view, it may be supposed that the treatment of cholera by stimulants and narcotics, has perhaps, this disadvantage, namely, a tendency to produce an augmentation of hydrocarbon in the blood and the tissues at the very moment when these latter require the introduction and assimilation of oxygen, and the parting and elimination of carbonic acid from the economy. If, however, choleraïc discharges, exhaustion and cramps, be arrested and removed, the carbonization due, upon this theory, to medication and the disease itself, may be worked off as a natural consequence of the arrest of the malady, and the re-establishment of the functional activity of the organs.

Such speculative objections can have little or no weight as against any treatment which has been found advantageous, how empirical soever that may seem.

In no disease, as has been already said, is the dose of medicine so uncertain as in cholera, owing to the fact that absorption is greatly impaired, if totally arrested, particularly with regard to certain medicinal preparations. Even brandy, laudanum, solutions of morphia, camphor, etc., often produce little or no appreciable effect. It may be necessary, for this reason, to augment the quantity more than would be safe in any other malady. Herein lies one difficulty of medication, together with the necessity of vigilance and skill in the physician.

It has been proved that a comparatively empty state of the blood vessels, as when copious venesection has just been performed, generally favors the rapid absorption. Now this condition of absorption, though virtually produced by choleraïc discharges, does not accompany cholera; but if the pathological and physical exosmotic choleraïc current should suddenly be reversed for the endosmotic current or absorption, the accumulated medicines in the stomach and bowels, may become very active, perhaps dangerous, nay poisonous.

The skill of the physician and the most appropriate remedy, must be unavailing in the treatment of cholera, when the physico-vital dynamics of the absorbent system are retrograde or altogether arrested. While there is life and even for a time after its extinction, absorption is probably never wholly lost, although it may be too feeble to be available in the treatment of the disease. The progress of modern research shows with a constantly accumulating force of evidence, that medicines for the most part, do not in the first instance act on the nervous periphery, and thence by sympathy upon the whole system, but primarily enter the circulation by absorption, assimilating rapidly with the blood, thereby medicating or affecting the economy. It has been proved by direct experiment that some medicines introduced into one jugular perform the circle of the system and appear in the opposite vein in a small fractional part of a minute. Not only the lacteals and lymphatics but the blood vessels themselves are concerned in this office.

The prevalent, and, perhaps, too exclusive physical theory of absorption or imbibition of medicinal and other substances which enter the circulation from the alimentary canal, together with the therapeutical proof extant showing that absorption is generally impossible, or at least very difficult and slow without solution; that solids introduced into the economy must first be dissolved before they can be taken up, all go to show that medicinal agents intended to remove cholera, should be thoroughly dissolved if possible before they are exhibited, water being the most absorbable vehicle or menstruum. Time being precious in this disease, medicinal agents should be prepared so that their action may be facilitated and speedy. Hence, upon this theory a watery solution of morphia should be preferred to its syrup, the tincture of opium to its powders or to pills, etc. Solids, as pills, have, nevertheless, one advantage over solutions; namely, they are not so readily vomited. Experimenters affirm that among liquids imbibition is retarded in proportion to their density; therefore, all unnecessary additions as sugar, gum, etc., should be avoided, as, upon this principle, they must prove barriers to immediate endosmosis or absorption.

It might be instructive, did the limits of this Journal permit, to refer to the British practice in treating cholera, first in India, and next in England, at the second invasion of 1848–9, and consequently after the experience in the latter country derived from the first epidemic.

Of the East India school, the most prominent representative at an early date, was Sir James Annesley, surgeon to the Madras General

Hospital—a voluminous writer upon the Diseases of India. He maintains that "bleeding is the sheet-anchor in the treatment of cholera;" he also recommends opium, camphor, ammonia, æther, and calomel; the latter in scruple doses.

The medical mind of England is supposed to have been represented at the Meetings of the Medical Society of London, in 1848 and 1849, on the treatment of cholera. Some of the principal physicians of England, whose opinions are reported in the London Lancet, may thus be summed up: Dr. Clutterbuck (since deceased) maintained that he had no knowledge of any satisfactory method of curing the disease except that which he called palliating symptoms as they occurred, trusting to time for the result, warming the patient if cold, stimulating with brandy, ammonia, etc., depleting if there was vascular excitement.

Dr. Stewart had no faith in anything but tartar emetic; 3 grains for a dose, to be repeated in half an hour.

Dr. Chowne considered cold-water [affusions?] towards the close of the disease preferable to any other treatment. Mr. Herd coincided in the cold-water treatment, affirming that it was not followed by the consecutive fever which killed so many patients, treated with calomel and opium, when the cholera prevailed on a former occasion; he is in favor of mustard emetics, warmth, sinapisms; 2 grs. acet. plumb., with half gr. opium, every two hours; opposes calomel.

Mr. Pilcher advocated the saline treatment with the oxymuriate of potassa and opium, which seemed to arrest purging and restore the secretion of the kidneys. When urine was secreted, the patient generally did well.

Jos. Ayre, M. D., of Hull, England, asserts "that the present mortality from cholera is three deaths for every four persons attacked—a mortality that shows that only the milder cases can recover, and which would recover if left unaided; and that no remedy is at present in universal use that can subdue the pulseless collapse." He says this ought not to be. He cures even collapse without the aid of stimulants or any auxiliary, by giving calomel alone, "one or two grains with a drop or or two of laudanum to assist the stomach to retain it, every five or ten minutes; this is my sole remedy in the stage of collapse." One of his patients took 580 grs.; one of his friends gave another 800 grs.; both were cured without any ptyalism. "It will be found that if calomel were not the efficient instrument for removing the collapse, it was removed spontaneously, for no other agent was employed." He found from his experience and that of his friends, "who followed the same course of treatment, that there was no ground for despair in the most unpromising cases of collapse, when the attendants did their duty; and it occurred to us all to witness recoveries under such circumstances of hopelessness, as to take from us nearly all anxiety about the result of ordinary cases of collapse." He treated 219 cases. These favorable results have never been witnessed in America.

C. Searle, M. D., late of the East India Madras Establishment, says that he has "had as much, if not more, experience in the treatment of this disease than any other individual in the kingdom;" he has written a work on cholera, dysentery and fever; and affirms that, "If any single remedy merits the name of specific in the cure of disease, calomel is that remedy in cholera." He denounces opium, which, according to him, annuls or supersedes the effect of calomel, torpifying, paralizing and arresting secretion. The chalk-mixture and opiates he calls "fiddle-faddle!" He gives an emetic, to be followed by 6 grs. of calomel, putting it on the tongue with salt; the latter to excite a flow of saliva in which to swallow the calomel. The calomel is given 1 to 20 grs. every hour. Mustard is applied over the stomach. When urine and bilious stools occur, he gives a dose of castor oil to prevent salivation.

The mercurial treatment of cholera in the East, and in England, was adopted very generally in America, with, in some districts, a freer use of calomel than had, perhaps, ever been known before. The late distinguished Professor Cooke, of Louisville, who published in the Transylvania Medical Journal his experiences in the mercurial treatment of cholera in the year 1832, may be named as the ablest of the ultra advocates of that method. The following synopsis of the treatment of fifty cholera cases, with the loss of but three, is submitted to the reader as an instructive example in therapeutical history: In case 7 three ounces of calomel in as many doses were given; in case 8 the same; in case 9 half an ounce, which was repeated several times during three days; in case 10 half an ounce; subsequently an ounce: all recovered. Of 14 cases, 6 took half an ounce each, 2 an ounce each, and the residue each a tablespoonful, all recovering. Mr. B. (case 28) took 4 tablespoonfuls, (probably six ounces); case 29 took a tablespoonful every 6 hours until he had taken seven, (probably $10\frac{1}{2}$ ounces); in case 30 three tablespoonfuls were given, (about $4\frac{1}{2}$ ounces.)

For a time, Dr. Cooke's opinions in favor of mercury as the remedy for fevers and cholera, swayed the medical mind, particularly in the south and west, to an almost unparalleled degree. As a teacher, a writer, a practitioner, and a conscientious man, he doubtlessly acted from a deep sense of duty.

Without making at present any further retrospective research into the various methods of treating cholera, it may be proper to conclude this paper, now much extended, by a few remarks upon the good and bad effects of mercurialism, together with a synopsis of the treatment adopted by the able surgeons of the U. S. Army, and reported in a quarto volume, (1856) compiled by Assistant-Surgeon Coolidge, U.S.A. under the direction of Brigadier Gen. Thomas Lawson, Surg.-General, U. S. A.

With regard to the curative action of mercury in this disease, there is, doubtlessly, much inconsequential reasoning, more particularly in reference to its constitutional or salivant action. In severe affections of the bowels, such as dysentery, diarrhœa, and cholera, this medicine is frequently not absorbed, or if absorbed, it does not salivate until the malady begins to subside, when its constitutional action is apt to be developed, which though it may not be excessive or dangerous, is detrimental, annoying, and even preventive of a speedy convalescence. As a general rule, salivation takes place with greater celerity in health and during convalescence, than during the active, increasing and persistent morbid action of fevers and bowel affections. Among the curiosities of medical experience, its suspended or postponed salivary action, sometimes witnessed, is not the least remarkable. Thus a small mercurial dose, administered during the persistent, active stage of disease, may produce no appreciable effect for one, two, or three weeks, when simultaneously with convalescence, salivation may set in and continue for weeks. Salivation is not desirable in itself, but merely as an evidence that the economy is under the influence of mercury.

In dysentery, I have known a dose of blue mass to remain apparently dormant one or two weeks, when, with the appearance of convalescence, it produced mercurial salivation which persisted six weeks. In cholera, I have known six grains of calomel (given with other medicines) to produce, simultaneously with recovery, a salivation which continued from one to two months. Few medicines are so valuable, and at the same time, so eccentric and uncontrollable as mercury. A severe salivation is sometimes dangerous, and at best is a serious and disgusting malady. It is, therefore, the duty of the physician to study how not to give it—how to avoid it, as well as how and when he is bound to give it to his patient notwithstanding its occasional ill-effects, which, fortunately, are infrequent.

The utility of mercury in the treatment of cholera is probably less than mercurialists suppose. The insolubility of mercury, and its slow action, in connection with the pervading paralysis of the absorbent system in cholera, and the rapid march of that malady, seem little favorable to its action anterior to the termination of the disease in recovery, or death.

The following is one of many cases, in which, even opiates and stimulants were taken without having produced any of the appreciable or marked effects usually due to their absorption: 1850, Nov. 28, 7, P. M.: Saw Mr. W., mate of the ship Thomas Church; aged 32; Englishman; resident five days; he attended to business until 4, P. M., when vomiting, purging, cramps and algidity took place; has taken within three hours before I saw him, (as the witnesses say) three teaspoonfuls of laudanum and as many drinks of brandy. His pulse is almost imperceptible; neither intoxication nor narcotism is developed; retains his senses. Died the same night. Can any one believe, in such cases, that calomel, naturally slow in its action, could save the patient, when neither the tincture of opium nor brandy appeared to have been absorbed?

Dr. Headland, in his work on the Action of Medicines, (*passim*) maintains at length, as fundamental, that neither blue mass, calomel, nor any other medicinal agent insoluble in water or the gastric fluids, can enter the circulation, without which, it cannot prove remedial. A few remedial agents, in rare instances, may act locally without having been thus absorbed into the circulation. In reference to calomel and blue mass, Dr. Headland says: "From the great similarity that exists between the action of these two, it seems likely that they are reduced by the gastric fluid to the same condition. Both must be rendered soluble before they can be absorbed. Blue-pill contains the metal itself in finely divided state, as well as a small quantity of the oxide. Calomel is an insoluble chloride of mercury."

The suppression of the urinary secretion is, in this disease, in grave cases, very common; for which diuretics are sometimes given, after which, not in consequence of which, urine is secreted, the flow of urine being due to the abatement of the disease and the resumption of the normal function. The same reasoning applies to the method of treatment by large doses of calomel, itself insoluble, and, given too, when absorption is reduced to zero. It is, then, but a foreign body in the stomach and intestines. But in this case, should the normal functions be resumed, this medicine is absorbed, and hence comes into action, and should it not produce a salivation, it may prove very useful in accelerating several secretions and excretions required by the economy for its depuration, while, at the same time, it may prevent the consecutive or febrile symptoms which sometimes follow those of cholera proper. No one can foresee nor control the action of mercury in such cases should that action be excessive.

The prejudices against mercury are, in many respects, wholly unfounded in regard to its supposed lodgment in the bones, and its supposed deterioration of the constitution. It may kill, or produce mortification, etc., by its temporary constitutional and local action. It may retard recovery. But that it breaks up the constitution or leaves chronic diseases as its sequelæ, may be doubted. On the contrary, it often has incidentally eradicated serious chronic, preëxisting maladies when given for an acute, existing one. It occasionally creates an increased and permanent susceptibility to salivation, not originally inherent in the individual constitution, so much so, that it cannot be given in the smallest doses without incurring the fearful risk of prolonged mercurialization. A hereditary or induced idiosyncrasy of this kind tends to restrict the use of mercury, and to render its administration a source of anxiety and embarrassment to a prudent physician. A bad salivation will bring more censure to the physician; than the death of his patient from an uncured disease.

As already indicated, a synopsis of the treatment of cholera recommended by the army surgeons, as reported in the Medical Statistics of the Army, (1856) will conclude this paper.

Surgeon Henry A. Stinneche, in his report on the Medical Topography and Diseases of Fort Monroe, recommends, in cholera, small portions of calomel, opium, camphor, and ipecac, in pills, every third or fourth hour; also stimulants, cordials, etc. Should these remedies prove inadequate in use, warm stimulating cataplasms of mustard and cayenne pepper, or epispastics to the abdomen; frictions with stimulating liniments; increase the internal stimuli and opiates; draughts of aromatic confection, tinct. opii, æther, or Hoffman's anodyne liquor, mint or cinnamon water; nutrient enemata: "In no condition of disease is the practical application of the proverb, 'give strong drink unto him that is ready to perish,' more appropriate. Besides such agents as may be embraced in this general term, we know of but few."

Surgeon Finley gives calomel, camphor, and quinine; creosote; ice.

Assistant-Surgeon B. M. Byrne, gives "calomel the main remedy, in scruple and half drachm doses, combined with ten grains of camphor, and repeated after each evacuation until bile appears in the stools. In some instances, more than 300 grains had been exhibited before this result was obtained; but in every instance, except one, in which bile was restored to the passages, the patient convalesced. As auxiliaries to this treatment, dry heat, occasional opiates, carbonate of ammonia, brandy, mercurial frictions, mustard plasters, etc., were employed."

In his report dated at San Francisco, California, Sept. 14, 1852, Surgeon Charles S. Tripler says of the treatment in cholera: "I think the free exhibition of brandy with capsicum and chloride sodium was about as successful as anything. We found the acetas plumbi, in doses of 5 to 10 grains, a valuable means of restraining the diarrhœa; I feel sure that many cases were relieved by it that would have terminated in malignant cholera without speedy relief. Mustard and bottles of hot water, with frictions of the surface externally; calomel, camphor, and quinine internally, were freely used. But as I have already remarked, and as usually happens in severe epidemics, the chances are that the cases first attacked will die, and that the ratio of the mortality will diminish with the duration of the epidemic. In this epidemic we lost about 80 men."

Dr. Tripler's regiment (4th infantry, 8 companies) embarked at New York, July 5th, 1852, for Aspinwall, New Granada, and California. About two weeks after embarkation, while yet on the Isthmus of Panama, cholera broke out among these troops, among whom, as above stated by Dr. Tripler, 80 were cut off. The troops sailed August 8th, from Panama for their destination, after which but one death occurred, and that was caused by "the secondary fever of cholera."

(*To be continued.*)

ART. III.—*On the use of Iodide of Potassium in the Treatment of Leucorrhœa by Injections.* Illustrated by cases: By JOSEPH B. PAYNE, M.D., Magnolia, Arkansas.

THE wise man said, "There is nothing new under the sun," and the saying applied to the practice of medicine in the present age, can admit of no refutation, and indeed of but little opposition.

Most of the remedies or curative agents lately brought into notice, more especially those which are published to the world as new discoveries, may be proved to have been used in very remote periods; and many too, have been well known among the teachers of medicine, in the very infancy of the art. The present age, perhaps, more than any other, has been characterized by the successful diligence and zeal which it has displayed in researches. The efforts made in the various arts and sciences, have been often rewarded by great and important discoveries, and none of the branches of knowledge can boast of more successful improvements than those which have been connected with medical inquiries. While concession to the truth of this opinion must be very generally acknowledged, it will also be allowed, the assiduity and ardor of pursuit after novelties, especially in the healing art, had been almost every where so exclusively directed to recent or modern innovations in practical as well as theoretical principles, that much very important, though ancient medical skill communicated by the writings of an early age, has been disregarded, or ignorantly confounded with pretended new discoveries; the new medical author or practitioner claiming the merit and honor, of first introducing as a beneficial novelty, some plan or method well known to his predecessors, and recorded in works yet extant, and of easy attainment. It is certain that many important articles of the materia medica, apparently of opposite tendency to one another, are judiciously used in morbid affections. To account satisfactorily for this fact, theory alone will not suffice, but experience will, in such instances, guide the physician's conduct, without regard to any theory; and the beneficial result of the use of seemingly opposite medicines, will often do away the extravagant respect so uniformly shown to theoretical reasoning in the practice of young physicians.

But my present object being to awaken the attention of my medical brethren to an article which I deem of greater importance and efficacy, and possessed of more valuable properties than are now generally ascribed to it. This remedy is the iodide of potassium.

I will now give the history of three cases which came under my care: although they may be imperfect in many particulars, yet I hope they are of sufficient minuteness and correctness to occupy the sphere they are intended for, in the mind's eye of the reader.

In the spring of 1856, Jane, a negress of Mr. E. S. Miller, *æt.* 30 years, of a leucophlegmatic temperament, came under my treatment. Two years ago she was attacked with dysmenorrhœa, followed soon after by prolapsus uteri, with a leucorrhœal discharge. When she came under my care the leucorrhœal discharge was of more than an ordinary quantity usually met with in such cases. When the discharge came in contact with the external parts, it produced excoriation. Previous to the appearance of the catamenia, the uterus would sink low into the pelvis; frequently making its exit beyond the labia externa. The catamenia was of the usual character and quantity for the first two or three days; then it would change its form in regard to quantity, and assume that of menorrhagia: never yielding but to the action of remedies.

Such is a general history of the above case when it came under my care.

My first object being to relieve the dysmenorrhœa and prolapsus of the uterus, which I accomplished after "so long a time," but with no diminution of the leucorrhœal discharge. I followed the usual course of treatment for its relief, but with no avail. Relying solely on an alterative course of treatment for its cure, my mind naturally led to the use of the iodide of potassium. I reasoned with myself thus: If the iodide of potassium is such an efficient alterative when taken by the mouth and addressed to the constitution generally, would its action not be more potent, if brought within direct contact with the diseased parts? Acting upon these premises, I commenced the use of the iodide potassium by injections per vaginam; and, much to my surprise, (though of an agreeable character,) the discharge made a speedy surrender. It has not made its reäppearance now, nearly a year since.

1857. Mrs. S., *æt.* about 21 years, of a sanguine temperament; has suffered much since her last confinement (six months ago) with leucorrhœa, of an ordinary character. Ordered a solution of iodide potassium by injections three or four times a day. The discharge was soon relieved.

Mrs. C., *æt.* about 28 years; leucophlegmatic temperament. Confined about seven weeks since with her fourth child. Suffered much after her accouchment with ovaritis. Leucorrhœal discharge somewhat profuse, and of a thin, white appearance. Ordered iodide potassium by injections. Discharge checked on the fourth or fifth day.

The quantity of iodide of potassium used was as follows: ℨiss to a half pint of aqua puræ.

Magnolia, Ark., August, 1857.

ART. IV.—*Scarlatina Cases:* By YELVERTON B. EGAN, M. D.

JAN. 15, 1856. Mary Anne Dodd, ætat. 15; sick five days. The tongue and internal fauces of a florid color; the external fauces much swollen; the eyes are suffused, the conjunctivæ of both unusually vascular. There is intense headache, with occasional delirium; a dull efflorescence pervades the entire surface; the respirations count 35 in the minute; pulse 140, small; bowels open from medicine given previous to my seeing her. Applicentur hirudines octo faucibus externis et postea imponatur cataplasma calidum emolliens. Abradatur capillitiam.

Jan. 16. Head relieved; two copious motions; efflorescence not so great; coughs much; the internal fauces are much swollen, and of a dark livid color; pulse 130, soft. Ordered tepid sponging of the general surface, to be repeated every hour during the day. Iterum applic. hirudines octo faucibus externis—postea applic. cataplas. vesicat. pectori; haustus effervescens subinde.

Jan. 17. Some sleep; pulse 135; breathing oppressed and hurried; wash as on yesterday; throat improved; headache gone; the leeches did well; the intellect at present is clear; bowels open; cough severe; thirst urgent. Applic. vesicator. inter scapulas. ℞. Antim. tart. gr. ii; infus ulmi fulvæ, f℥ viii; Sumat ℥ii, urgente tusse.

℞. Hydrarg. chlorid. mit. gr. vi; pulv. ipecac. gr. ii; pulv. antimonialis gr. vi. M. Divide into six parts; one to be taken every three hours; tepid sponging.

Jan. 18. Improved. Continue the tartar emetic mixture.

This patient progressively improved, and was convalescent on the 9th of February.

This case affords evidence of congestion in the brain, which state was neglected for the first days of the girl's illness; the pulse and respirations having harmonized, augured favorably.

CASE 2. Feb. 2, 1857. John Dillon, ætat. four years. The external fauces are much swollen; the internal florid; the entire surface of the body is covered with an efflorescence; the papillæ of the tongue are to be seen projecting through a thick fur on that organ; skin pungent and harsh to the feel; pulse 130; respirations 35. ℞. Pulv. ipecac.; ext. scillæ ʒ i; water f℥ i: one half to be taken immediately, and the remainder in four hours afterwards, unless vomiting should intervene. Applicentur hirudines sex faucibus externis; to be succeeded by a warm poultice of flaxseed. To have a hot bath in the evening, and to take a tablespoonful of the infusion of senna every two hours till it operates after the vomiting shall have ceased.

Feb. 3. Vomited freely; leeches did well; rash more developed; tongue cleaning; the external fauces much swollen. Continue the poultice; nitrate of silver in solution to be applied to the internal fauces.

Feb. 4. The tongue is now clean and florid, the fur having disappeared; the fauces continue swollen; the efflorescense is much less on the surface; pulse 110, soft. Tepid sponging. Iterum applic. hirundines sex faucibus externis; continue the infusion of senna.

Feb. 5. Going on well.

Feb. 7. Convalescent.

Case 3. Feb. 24, 1857. William Dillon, ætat. 11; brother of the preceding. Fourth day. Efflorescence on the trunk and lower extremities; tongue florid; papillæ to be seen in some parts pointing through a fur in the centre of this organ; the throat internally and externally tumefied: the former especially, from submucous infiltration; bowels constipated; skin hot and harsh to the feel; pulse 135; soft. To have a warm bath in the evening. Applic. hirud. decem faucibus externus; to be succeeded by a flaxseed poultice. Head to be shaved. To take a dose of castor oil; to have the throat occasionally brushed with solution of nitrate of silver.

Feb. 25. Bowels open; pulse 130, soft. Continue the poultice and nit. sil. ℞. Hyd. chlorid. mit. gr. viii; pulv. antimon. gr. vi; zingib. gr. ii. Make four powders; take one every third hour.

Feb. 26th. The throat is much improved; skin dry, but its temperature has fallen; pulse 120, soft; tongue florid; bowels not open. To have an enema in the evening; continue the powders and poultice; tepid sponging, occasionally.

Feb. 27. Doing well.

Feb. 28. Convalescent.

Case 4. Feb. 15, 1857. Lawrence Dillon, ætat. 19; a third brother. Complains of sore throat; no efflorescence of the skin; pulse 110, full and bounding; tongue florid; the soft palate is much swollen; there is exquisite headache, with pain extending along the spinal column; thirst urgent; bowels constipated; skin pungently hot. Ordered tepid sponging of the body; venesectio ad f℥ xii; applic. hirudines xii, faucibus externis; with the flaxseed poultice afterwards. ℞. Pulv. ipecac ℈ i; tart. emetici gr. i; aquæ f℥ ii. M. St. statim. After the emetic to have purging mixture of sulphate of magnesia with the tartar emetic.

Feb. 16. Blood lazy; pulse 84, soft; throat better; tongue still florid; vomited well; bowels open; much thirst; surface pungently hot. Continue tepid sponging; to have an effervescing draught; the head to be shaved.

Feb. 17. Continues to improve; distressed by cough. ℞. Tart. emetici gr. ii; infus. ulmi fulvæ f℥ vii. M. Take a tablespoonful when the cough is troublesome.

Feb. 18. Cough continues; pulse 94, soft and full; sonorous râle audible over the antero-superior part of the chest, on the right side; bowels constipated. Applic. hirudines xii thoraci; pil. hydrarg. c. colocynth. ii; with purging mixture as before.

Feb. 19. Cough better; pulse 85, soft; the throat much improved.

Feb. 22. Convalescent.

CASE 5. Feb. 24, 1857. Julia Bishop, ætat. 30; unmarried. Fourth day. The entire of the body is covered with a deep, lobster-colored efflorescence; there is considerable tumefaction of the external parts, about the throat; internally it is also much swollen; headache, with intolerance of light; the eyes are much suffused; pulse 130, full; tongue florid at the apex and sides, furred in the centre; the elevated papillæ can be seen protruding; there is much thirst; extreme præcordial anxiety. Head to be shaved and sponged; applic. hirudines xvi faucibus externis; poultice afterwards; haustus emeticus. Pil. purgantis 2 et mist. sulph. magnesiæ, etc., after the emetic has operated.

Feb. 25. Much effusion of blood from the leech bites; the emetico-cathartics have acted well; she states that she can swallow better; the poultice over the leech bites has given her much comfort; headache continues; pulse averages 120. Poultice to be continued; tepid sponging to the surface; appl. hirudines xii temporibus. ℞. Hyd. chlor. mit. gr. viii; pulv. antimon. gr. vi. M. Ft. pil. iv. Take one every 3 hours.

Feb. 26. Head much relieved; throat externally and internally improved; pulse 110, soft; bowels constipated. Poultice to be continued; the throat to be brushed with nit. silv. solution; continue the pills and take a dose of oil.

Feb. 27. Doing well.

ART. V.—*Statistical Researches on the ratio of Mortality from Pulmonary Consumption in the Northern and Southern States, as proved by the Mortality Statistics of the Seventh Census of the United States, etc.,* (1850): By BENNET DOWLER, M. D.*

CONSUMPTION, the great destroyer of human life, which occupies an unusual space in the present number of this Journal, fills at the present time a large space in the medical mind of all civilized countries. A great revolution (revolutions seldom go backward) is now taking place in regard to the beneficial influence of climate, particularly as to the advantages of a hot climate in either arresting or in preventing consumption. The conclusions recently arrived at from statistical data are adverse to the opinions formerly entertained as to the curative or pro-

* This paper, written hastily, in fragments, was sent to press as an introduction to the extended article on consumption in the department of the Journal on the Progress of Medicine. It has grown to an unexpected length, and has been transferred to the department of Original Communications, being, as is supposed, an original application of the facts developed by the last Census, to show the distribution of consumption in the Republic.

phylactive influences of tropical and warm climates. It is to be borne in mind that the apparently exact data which have been taken from the army records, are of course, restricted to a particular class, that is soldiers, who often vibrate from climate to climate, all the while encountering the privations and exposures ever attendant upon camp-life. Fevers, dysentery and diarrhœa generally prevail among this migratory class to a greater extent than among the natives or acclimated population, and even pulmonary affections other than tubercular consumption, might be supposed to belong to the same category.

The influence of the physical agents, as cold, etc., in connection with insufficient clothing, diet and comforts, is, when excessive, doubtlessly calculated to produce pulmonary affections among civilians as well as soldiers. Thus Mr. Bancroft, the historian, says that in January, 1621, "when the Pilgrims began to build houses at New Plymouth, such had been their exposure, though only a few days in the climate, that one half were wasting away with consumptions and lung fevers. It was not until spring had far advanced, that the mortality began to cease; the living had been scarce able to bury the dead—the well to take care of the sick."—(i, 313, 314.)

The prevalent opinion against warm and for cold climates can only be accepted provisionally until further research shall have determined its validity or falsity definitively.

The following summary taken from the Medical Statistics of the U. S. Army, recently compiled by Dr. Coolidge, U. S. A., 1856, (pp. 496–7,) is of great interest in regard to the climatic influences upon the origin and development of phthisis pulmonalis in the army.

"With the exception of West Point, the lowest ratio of cases of consumption occurs in New Mexico, being only 1.3 per 1,000; and the highest in the South Atlantic region, where it is 9.2 per 1,000. It will also be noticed that the regions designated as the South Interior East, and Gulf coast of Florida, give the next highest proportions, being respectively 7.2 and 6.9 per 1,000 of mean strength. The ratios for these three regions, and also those for California, are higher than for any of the regions in the northern division. A careful examination of the consolidated temperature, rain, and weather tables, in connection with the statistics relative to consumption, will, it is believed, lead to the following conclusions: *First.* That temperature considered by itself, does not exert that marked controlling influence upon the development or progress of phthisis which has been attributed to it. If a high range of temperature were favorable to the consumptive, the South Atlantic region, the South Interior East, and the Gulf coast of Florida, should exhibit a lower ratio than the colder regions of the north and the north-west, whereas the contrary obtains; and again, if a high range of temperature were the controlling element in causing an increased ratio of this disease in the two southern regions above named, we ought *not* to find a lower proportion of cases in Texas, where the temperature is higher, nor in the South Interior West, where it is nearly the same as in the South Atlantic region. *Second.* That the most important atmospherical condition for a consumptive is DRYNESS. An examination of the rain tables will serve in part to elucidate this position, and in part only, for the total annual precipitation in rain and snow may be equal in two or more places, and yet the average condition of the air as respects moisture—the dew-point—may widely differ. It is impossible to represent all these distinctive features by statistical tables, but the fact has been forcibly impressed upon the compiler during the minute examinations necessary to the preparation of this report. *Third.* Next to dryness in importance is an EQUABLE temperature—a temperature uniform for long periods, and not disturbed by sudden or frequent changes. An uniformly *low* temperature is much to be preferred to an uniformly *high* temperature. The former exerts a tonic and stimulating effect upon the general system, while the latter produces general debility and nervous exhaustion. The worst possible climate for a consumptive, is one with long continued high temperature and a high dew-point."

Dr. Coolidge supports his deductions by the "Statistical Reports on the Sickness, Mortality, and Invaliding in the British Army," showing the amount and ratio of cases of consumption at different stations occupied by British troops :

Station.	Mean Strength.	Number Treated.	Deaths.	Ratio of cases per 1,000 of m'n strength.
Gibraltar,	33,131	176	116	5.3
Malta,	21,172	129	91	6.0
Bermuda,	11,224	100	54	8.9
Nova Scotia and New Brunswick,	26,806	149	111	5.5
Canada,	90,456	524	327	5.7

Judging from the Army Statistics, it would appear that everywhere within the vast territories of the United States, the Indian race wheresoever distributed—whether in the north or south—whether to the east or west of the Rocky Mountains—suffers severely from tubercular consumption, and other pulmonary affections, and also, from scrofula. The hardships of savage life as well as the hardships of camp life among civilized nations seem either to cause, or to be attended with, a high comparative ratio of mortality. A bad or insufficient diet as well as bad air and insufficient ventilation, must be considered among all people, and, perhaps, in every climate, either as direct or indirect causes of consumption. Be the climate hot or cold, humid or dry, neither savages, soldiers, nor any single class can be a reliable criterion for determining the inherent curative or morbific influences of climate upon the aggregate population of a country.

Hence a certain degree of distrust inheres in the entire statistical history of the army reports among all nations as types of climatic influences in regard to other classes. It were easy to quote authorities adverse to army reports, particularly in reference to consumption. In the National Cyclopædia (London, 1850, vol. ix, 548,) it is asserted that "in England and Wales, according to the reports of the Registrar-General of Births, Deaths and Marriages, the mortality is 19.55 per cent. of the total number of deaths, or 3.82 annually out of 1,000 living. In France it is about the same. On the eastern frontiers of the Cape of Good Hope, where the atmospheric vicissitudes are sudden and great, the thermometer in summer sometimes varying, in the course of a few hours, from 110° to 64°, and in winter from 75° to 32°, it is only $3\frac{1}{2}$" [per cent. of the total mortality]. "The natives of some tropical countries seem so little subject to diseases of the lungs, that among 74,850 native troops serving in the Madras presidency, the deaths by every description of disease of the lungs, did not on an average of five years exceed one per 1,000."

It is not intended in this preliminary sketch (which will be followed by a collection of practical papers on consumption,) to endorse either cold or hot climates as prophylactic or curative of phthisis; but to suggest the propriety of distrusting for the present the military statistics condemnatory of warm climates as being worse than the cold for consumptives.

Dr. W. H. Yates, in his work on Egypt, (2 vols., Lond., 1843,) says of that hot country, (nearly in the latitude of Louisiana,) that persons, who, like himself, have sojourned in Egypt, after being declared consumptives, "have not only recovered a certain degree of health, but are alive now, and have been enabled to return to Europe."—i. 141.

Sidney Smith maintained that in one particular, the oath of no Scotchman can be believed, namely, concerning the climate of Scotland. While British, French, and American statisticians, chiefly of the army school, are at present mustering their serried columns of figures to prove that warm climates are injurious or at least of no benefit to consumptives, it may not be amiss to pause and reconsider the matter before accepting these conclusions definitively.

With regard to this Republic, it is proposed to refer, at present, to the official statistics of the Seventh Census, which gives the deaths for one year. The mortality statistics, taken at the same time the census was taken, and compiled by Mr. DeBow, superintendent of the census, give for the year ending June 1, 1850, the aggregate deaths in the United States, at 323,023, of which number 54,800 died of diseases of the respiratory organs, including, of course, consumption. Diseases of the respiratory system, therefore, form nearly one-sixth of the total mortality or one in 5.894+. The deaths from consumption alone amounted to 33,516, or one in 9.636+ of the whole mortality.

The first State in the census list, is Alabama, in which the deaths amounted to 9,091; consumption giving not one to 25 (25.11+), against one in 9.636+ in the whole Republic.

The deaths in Louisiana, 11,956, of which 641 were from consumption, give a little over one in 19, being not half as great as the general average, and nearly five times less than some of the northern States.

The deaths in Maine reached 7,584; consumption 1,702, or nearly one in four, or 4.45. Now compare Maine with any of the southern States, say Georgia. The total mortality of Georgia reaches 9,925; consumption being 279, or nearly one in 36 (35.57+) of the whole. About nine times less!

The total deaths in Massachusetts, 19,404, give for consumption 3,426, or nearly one-fifth, or one in 5.37+.

The mortality of the year above mentioned, reached in South Carolina 8,047, of which 267, a little over one in 30, were from consumption.

These somewhat troublesome calculations might be extended, did time permit. Several southern and northern States taken at random afford results, as will be seen, most favorable to the southern States, so favorable, indeed, as to surprise the writer; and nothing but an official census, in the taking of which there can be no motive to deceive, could induce him to view these numerical results as at all probable.

Consumption gives a ratio of deaths, compared to the whole mortality, about eight or nine times higher in Maine than in Georgia! Massachusetts nearly four times more than Louisiana—five times more than Alabama—seven times more than South Carolina!

Dr. Coolidge's fellow officers and soldiers—M. Rochard's countrymen, and Victoria's subjects, may or may not contract phthisis in warm climates; but the civil population of the southern States, both white and black, are more fortunate in this respect than their northern neighbors.

Since the above pages were sent to press, the following data have been added: Total mortality in the State of Mississippi, 8,721; consumption 332, that is not one in $26\frac{1}{4}$, or one in 26.27+.

Total deaths in Connecticut 5,781; consumption 968, more than one in 6 or one in 5.97+.

Total deaths in Arkansas 3,021; consumption 132, nearly one in 23, or one in 22.88+.

Total deaths in Vermont 3,129; consumption 751, about one in 4, or one in 4.1+.

New Hampshire, total 4,231; consumption 924, or one in $4\frac{1}{2}$ nearly, or one in 4.57+. North Carolina, total 10,165; consumption 562, or one in 18 nearly. New York City, total 11,883; consumption 1,819, or one in $6\frac{1}{2}$. New Orleans, total 4,312; consumption 362, or one in 11.35+.

New Jersey, total deaths 6,865; consumption 915, one in $7\frac{1}{2}$, or one in 7.5+.

Florida, total deaths 931; consumption 43, nearly one in 22, or one in 21.65+.

The official census of Boston for five years, ending with 1854, compiled by Dr. Curtis, shows an aggregate mortality of 19,983, for that period; consumption having contributed 3,421; that is more than one in 6, or one in 5.84+. By adding pneumonia, 1,108, to consumption, these maladies give nearly one-fourth of the total mortality.

From the official Registration Report of Rhode Island for 1855, (pages 63 to 66) it appears that in every hundred deaths in that State, 21.23 are caused by consumption, the city of Providence having given for a period of fifteen years a still higher ratio, namely, 22.11, or nearly one-fourth. Diseases of the respiratory system, throughout the State, caused in three years and seven months 1342 deaths, or 26.68 per cent. of the whole mortality. The mortality from consumption in the colored population in 1855, amounted to 32.47 per cent. of all the deaths, and 40.26 per cent. for all fatal pulmonary maladies.

The total number of deaths in Texas, for the year ending June 1, 1850, was 3,057; consumption gave 112, about one in $27\frac{1}{4}$, or one in 27.29+.

These data, derived from nearly twenty-four millions of people, having all the same undeviating significance—always favorable to the South, and constantly against the North as it relates to consumption, outweigh all the military statistics extant; at least the statistics of the handful of soldiers constituting the army of this Republic, cannot invalidate the climatic and vital statistics of more than twenty-three millions of people, occupying a vast geographical range of latitude, longitude, altitude, and varied medical topography.

The mortality statistics of the U. S. Census, makes the case far worse for the South, as to consumption, than the reality warrants; because, the popular opinion in favor of the South as a residence for consumptives, sends a vast number of such patients to the southern States, swelling the bills of mortality, while the South rarely, if ever, sends a consumptive to the North for the benefit of its climate.

It will be found, according to the mortality statistics of the Seventh Census, the most extensive and reliable evidence extant, that the intensity of consumption diminishes inversely with the squares of the distance from the northern littoral of the United States.

It may, however, be thought, that what the South gains in the prevention of consumption, it loses by an excessive mortality from yellow fever and other diseases. Here, again, the mortality statistics of the Seventh Census, eliminates a result little expected, namely, that taking the slave-holding States as the limits of the South, and the non-slave-holding States as the limits of the North, the ratio of deaths to the number of the people is greater in the North than in the South.

Since the above mentioned data were in type, though not printed off in the forms of the Journal, the following documents were received through the postoffice. They are subjoined with a view to elicit the truth in regard to the geographical and climatic predilections of consumption—questions, compared to which, cholera and yellow fever sink into insignificance, seeing that consumption sweeps into the tomb from one-fourth to one-fifth of the population in some districts, its victims being generally in the prime of life.

If Maine, for instance, loses nine times more than Georgia in proportion to the whole mortality, life insurance, life itself, and the material interests of property and of the population, as well as the prophylactic and curative influences of climate become topics of permanent importance, and the well being of society demands that these things should be known as a guide to conduct.

NEW ORLEANS, Sept. 26, 1857.

Mr. Editor: A few days since I accidentally came into possesion of a Boston paper, which contained the enclosed publication, written in reply, as it states, to inquiries on "consumption," for some Life Insurance Company at the north, by our fellow-citizen, Dr. E. H. Barton.

I trust that you will give publicity to this paragraph in your "Journal," as no doubt the perusal of the strange doctrinal assumptions which it sets forth, dogmatically—and very remarkable statistical inferences which are so cooly asserted, will be quite as novel and instructive to many of his medical *confrères* in this city as it is to myself.

But in truth, from the high position which Dr. Barton claims for himself in medical science, and also, in medical literature, as well as the importance which is given to it by the editorial comment preceding it, it requires more than a mere passing notice of this kind. The investigation of the soundness or unsoundness of the principles and doctrines contained—the truth of the real or imaginary statistics assumed, I will leave to your ability and well known critical acumen to perform.

Yours very truly,

* * * * * * *

B. Dowler, M. D., etc., etc.

"Consumption.—The opinion is very prevalent that this disease is as natural to cold countries, where the climate, like ours, is variable and great changes of temperature are often experienced in a few hours, as the yellow fever is to low southern latitudes, and those afflicted with it are often sent, even by physicians, into warm countries, with the hope and expectation of a cure. Some person who has been hunting up facts and statistics for the purposes of life insurance, has elicited some curious information on this subject from Dr. E. H. Barton, of New Orleans, which goes far towards overturning the common belief in regard to it. We subjoin the questions and answers:

Q.—Are pulmonary diseases rife in certain portions of the southwestern States?

Reply.—They are, (the exact amount I cannot trust to my memory to state.)

Q.—If so, under what forms and modifications from those of the north?

Reply.—Phthisis pulmonalis, or consumption proper, exists to a large extent at the south, and particularly on the sea board and low, damp places among both colors. There is more pneumonia and pleurisy, as a class of inflammatory diseases of the pulmonary apparatus, at the north and less at the south; but I think I can venture the statement, without having the figures before me, that *phthisis to the population* is more rife at the south than at the north, and particularly in low, damp and marine regions; I know how contrary this is to popular and professional belief.

Q.—The relative proportion of such diseases as occurring among natives and strangers?

Reply.—Statistical records do not show; but in my experience they certainly exist more among the natives than strangers, excepting from the comparison those who visit the climate from its supposed curative effects.

Q.—Are the cities or the country most subject to such diseases?

Reply.—The cities are more subject to phthisis among the whites, and the country among the blacks. And the inflammatory affections of the pulmonary apparatus are also more rife in the country.

Q.—What influence has the topography of the section of country in which such diseases prevail upon their frequency or security?

Reply.—Whenever the causes of moisture exist to an unusual degree, there likewise the liabilities will exist and predominate. But in the higher and drier portions of the country, the other or inflammatory pulmonary affections are most apt to prevail.

Q.—Is the climate of Cuba adapted to northern invalids who are suffering under tubercular or other pulmonary diseases?

Reply.—First. From several years professional experience there, I consider it *fatal* to any form of phthisis or tubercular disease, after it has arrived at the suppurative or ulcerative stage—indeed, not safe in any way.

Second. In relation to the other inflammatory pulmonary diseases it is different. In *their* earlier stages it is often of great benefit.

The remarks under the first head apply very particularly to the city of Havana and the cities generally, and the reason is palpable enough, for here there are two immense sources of exhaustion from the disease—in the great drain from the lungs and skin, and the second is derived from the enfeebling heat of the climate.

Q.—Is the occurrence of diseases of the respiratory organs frequent in this island?

Reply.—They are very frequent throughout most of the island, and vary from ten to twenty-five per cent. of the entire mortality. The city of Havana is the worst of the whole island in its liability to, and prevalence of this class of diseases. Indeed, I think I may be justified in stating that the deaths from phthisis is from twenty-two to twenty-three per cent. of the entire mortality; and the mortality from all pulmonary diseases amount there to twenty-five per cent, of the whole mortality. I now refer to the mortality occurring among the natives of the island. Those who visit it here and die, only furnish a small fraction of a per cent.—not sufficient to influence general deductions.

Q.—Do these remarks apply to other West India climates?

Reply.—I believe they do, so far as the principle goes, of great and exhausting heat, enfeebling the patient and impairing his vital energies and reactive power in the secondary stages of phthisis and all tubercular diseases.

Q.—Which portion of Cuba is best adapted to invalids suffering under pulmonary diseases?

Reply.—The interior and more elevated portions.—*Boston Journal*, August 28, 1857."

The above views of consumption "as being more rife at the south than the north, though contrary to the popular and professional belief," do not coincide with Dr. Barton's figures as he has reported them, as late as 1849, in Dr. Fenner's *Southern Medical Reports*, vol. i, p. 85, to wit:

	Death from Phthisis to Total Mortality.	Death from all Pulmonary Diseases to Total Mortality.
Philadelphia........	14.84 per cent.	28.57 per cent.
New York..........	17.50 "	28.08 "
Havana............	19.50 "	25.07 "
Boston.............	15.13 "	23.97 "
Baltimore..........	18.20 "	23.33 "
Charleston.........	18.27 "	27.73 "
Mexico (city).......	2.45 "	16.76 "
Norfolk............	11.01 "	12.78 "
New Orleans.......	9.37 "	13.87 "

In regard to the mortality from consumption in New Orleans (though not put half as high as in Philadelphia and New York) Dr. Barton justly says: "Many [consumptives] doubtless, visiting this mild climate [in New Orleans] on account of its kindness to pulmonary invalids, and here falling victims to the disease already beyond the reach of art or climate, and adding to our mortality in that respect. The whole class amounted to 876 [for the preceding year]. Of these, CONSUMPTION embraces 592; leaving only 284 for all other pulmonary diseases! By the table it will be seen, that notwithstanding the addition made to our mortality by emigrants and visitors with these diseases, yet we are more favored than any large city in this hemisphere."

The late Dr. Drake, misled by military statistics, concluded that "the mortality from consumption is greater in the south than in the north." He says, however, that "it is necessary to recollect that consumptives, whether predisposed or actually ill, are constantly traveling or migrating from the northern to, or through, the more southern cities, the reverse of which scarcely ever happens." Dr. Drake says that the ratio of deaths from consumption is 71 per cent. greater in New Orleans than in Boston. These facts are not merely conclusive, etc., of the greater mortality from that disease in the south than in the north," etc.—(*Dis. Valley Miss.*, vol. ii.)

The climatic law of mortality applicable to consumption cannot, strictly speaking, be deduced, excepting from the native population. As already stated, the immigration of consumptives for the real or supposed benefits of the climate in New Orleans, Havana, and other southern places of resort during the winter or permanently, might give such places an apparently high ratio of mortality not inherent in the climate. If the prevailing theoretical figures and opinions should induce consumptives to remove to the northern States, to Maine, for instance, the mortality from consumption in that State might be doubled so as to reach one in two of the total deaths, instead of one in four and a fraction as at present.

In a very elaborate classified table of the deaths in the cities of New Orleans and Lafayette (now consolidated) for the year 1850, by Dr. J. C. Simonds, it appears that the total deaths were 8,086; to this aggregate, consumption contributed but 681, or one in thirteen and a third (13.33+), agreeing with Dr. Barton's report for the preceding year.

In 1854, Dr. Barton published in his *Report on the sanitary condition of New Orleans* a table showing that during the preceding year, the mortality from consumption was to the whole mortality but one in twenty-one nearly (1 in 20.7+). As this was the great epidemic year of yellow fever, the latest official statement will now be given, namely, *The Report of the Board of Health to the Legislature of Louisiana*, (Jan., 1857) which states that from the 27th of April, 1855, to the 1st of May, 1856, the mortality of the city of New Orleans amounted to 9,085, to which number consumption contributed but 652, or one in fourteen nearly, (1 in 13.93). For the year ending December, 1847, the total mortality was 7,499; consumption being 572, or one in 13.11+.

The total number of deaths in Boston for the five years ending with 1854 was 19,983, including 3,421 deaths from consumption, or as 1 in 5 and a large fraction, (1 in 5.87+). The deaths from pneumonia during the same period reached 1,108; from both diseases 4,529, exceeding one in four and a half, (1 in 4.41+).

Amasa Walker, Esq., Secretary of State of Massachusetts, in his able official Registration Report, (Boston, 1851) says that "of the 102,596 deaths (including the city of Boston) within the last nine years, and whose diseases were specified, (besides those who died by violence) 22,342 are from consumption! that is more than one out of every five deaths (21.78). This may be confidently stated as very near the general law; inflammation of the lungs added to consumption, make 26.66 per cent., more than one quarter of the mortality."

The statistics of consumption in New Orleans indicate a mortality more than twice as high as either the northern or southern sections of the residue of the State, according to the official mortuary statistics of the 7th Census of the United States for the year ending June 1, 1850. Thus in the northern section of Louisiana, total deaths 3,664—consumption being 120, or 1 in $30\frac{1}{2}$; in the southern section, total deaths 3,980; consumption 159, or 1 in 25.03. This disparity so favorable to the rural districts as compared to the city, is accounted for by the great influx of consumptive immigrants who come to reside in the latter.

In the eastern district of South Carolina, wherein 2,339 deaths took place, 102 occurred from consumption, or 1 in 23 nearly, (1 in 22.9).

The city of Charleston forms a part of this district. The northern district of this State, wherein 1,853 died, included but 72 deaths from consumption, or 1 in 26 nearly, (1 in 25.73); in the southern section, deaths 1,883; consumptions 52, or 1 in 36.2. Hence it appears that the district in which Charleston is, has, like New Orleans, a higher mortality from this disease than the residue of the State, and, probably, for the same reason, namely, the immigration of consumptives.

It may be allowable once more to say that it is absolutely contrary to the fundamental laws of probability, that the United States' marshals employed in taking these mortality statistics of the year 1850, should have all erred in the same manner in their enumerations concerning the deaths from consumption throughout this vast Republic. It transcends the possibilities of the doctrine of chance, that there should be a material error among so vast an assemblage of facts collected at the same time, under similar circumstances, without collusion, and without a motive to deceive. That 24 millions of people, north and south, should make false or mistaken statements, all tending uniformly to show that consumption prevailed from four to nine times more in the north than in the south is impossible. Put twelve millions of white and as many black balls in a box, and let the U. S. marshals, blindfolded, draw out twelve millions in succession, and then examine whether all drawn have the same color? A few drawings like the isolated military statistics, might be of the one color alone, but a large number of drawings will develop and forever maintain the law of uniformity with slight and unimportant oscillations. To suppose that the ratio of consumptives and the number of deaths are governed by no positive law, or a capricious one, is unphilosophical. It is probable, though not statistically proved, that the mortality from consumption in the south is greater now, in equal numbers of the population, than it was in early times, but there can be no doubt that among the inhabitants of the southern States, up to this time, consumption is less prevalent than among those of the northern States, be the cause what it may. From the nature of the case, no isolated individual opinion or experience is sufficient to decide in this respect, upon the climatic workings of a country larger than all Europe, especially when opposed by the statistics officially reported of the entire nation.

ART. VI.—*A Letter to the Honorable Charles M. Waterman, Mayor of New Orleans:* from JAMES JONES, M. D., one of the Delegates to the Quarantine Convention.

DEAR SIR:—I have the honor of enclosing for your perusal the official minutes of the proceedings of the Quarantine Convention held in the city of Philadelphia, on the 13th of last May. Although sanctioned and promulgated by the authority of a large majority, there are parts of these proceedings so hurriedly adopted, which, in my opinion, do not justly represent the collective intelligence and deliberate convictions of the respectable delegates to this convention, however properly they may be regarded as the favored measures of those by whom it was convoked, regulated and controlled.

The neglected precedents of the great sanitary congresses assembled at various periods in Europe, offer valuable aid to those projected in America. From the minutes of the last general international conference held at Paris in 1852, by delegates from every great power in Europe, I will briefly present a few of the principal measures adopted as a standard of comparison in appreciating the resolutions of our own quarantine convention.

In relation to diseases susceptible of being introduced by arrivals from sea, the high contracting parties agreed

Firstly. To apply their regulations only to cholera, plague and yellow fever.

Secondly. That all vessels shall be provided with bills of health—to be of two kinds, clean and unclean.

Thirdly. To establish uniform terms of detention, and to determine their minimums and maximums: making the

Minimum quarantine in reference to plague....	10;	maximum	15 days
" " " yellow fever	5;	"	10 "
After a long voyage from an infected port, without any sickness on board......................		"	5 "
With sickness on board......................	7;	"	15 "
Detention of ships from cholera ports..........			5 "

Fourthly. All articles of merchandise are to be divided into three grades or classes, viz.:

1st. The first class consists of those which, if on a ship bringing foul bills, are to be invariably quarantined and purified. These are baggage and other personal effects; rags and remnants of clothing; hides and peltries; hair and all other animal refuse; wool and silk.

2d. Includes those subject to discretionary or conditional quarantine, viz.: cotton, linen and hemp.

3d. All others not thus named, which are exempted.

Fifthly. Full provisions are to be made for the institution of lazarettoes, and other necessary asylums for passengers and crews.

Sixthly. All ships arriving from sea are to be assessed for sanitary fees according to their tonnage; a regular per diem is to be paid for detention by the ship, and lazaretto charges daily by passengers and crews.

Seventhly. Merchandize shall be taxed for purification by weight or value.

The Royal decree promulgated in May, 1853, in conformity with the acts of this congress, gives the most minute directions to be observed by ships when in port, when at sea, and when about to enter. It makes ample provisions for the organization of quarantine establishments; indicates the necessary officers; defines the different forms and degrees of quarantine; gives ample directions for the processes of ventilation, landing, purification, and if necessary of burning and sinking of certain articles; and provides requisite rules for the prosecution of delinquents, and the infliction of fines and penalties for the contravention of any of these necessary regulations.

In passing from these practical and systematic ordinances to the resolutions of the Philadelphia Convention, we remark:

Firstly. That as objects of quarantine regulations, yellow fever and cholera are entirely secondary to small pox and typhus.

Secondly. That notwithstanding the reiterated indictments of foul ships, foul cargoes, filthy bedding and squalid passengers, there is no provision for a preliminary survey before the voyage, or for the exaction of proper certificates issued at the time of departure.

Thirdly. While professedly legislating on the institution of uniform quarantine regulations, there is no specification of the requisite periods of time necessary for the detention of suspected ships.

Fourthly. No basis has been proposed for a uniform scale of fees and charges for inspection, detention, purification and other necessary processes.

Fifthly. There is no recommendation for classifying articles of merchandize according to their relative characters as generators or vehicles of disease—if we except the manifest efforts to proscribe sugar, molasses, grain and cotton, the great staples of our southern ports. I had the first three erased from this catalogue, but could not prevail when we approached the last. I insisted on the classification of all of the so-called dangerous articles or of none. In all the European lists you will find various animal and vegetable substances standing far above cotton—several of which are more porous and more perishable. I am aware of no well attested facts affirmative of the reputed character of cotton as a vehicle of foul air. Tardieu and other sanitarians entertain considerable doubt on this subject. There is nothing in the reäctions or minute structure of cotton indicative of extraordinary porosity, it floats a long time on water; and the microscopic observations of Raspail and of Bauer have long since established that the fibre instead of being cylindrical and open at the extremities, like linen and hemp, is as flat as a ribbon, with adherent sides and ends perfectly closed.

By referring to the proceedings of May 14th, you will perceive that I succeeded for the time in having the fourth resolution laid on the table. I contended—I will always contend in relation to this resolution and others of a similar character—that an association of gentlemen of almost every profession, ostensibly convened for the recommendation of uniform quarantine regulations, had no authority to resolve itself into a scientific congress for the promulgation of hypothetical dogmas on the origin and propagation of epidemics. Entertaining in common with many distinguished men in my profession, that every form of these zymotic diseases originates from the operation of some specific yet undetermined agent peculiar to each, I hold it unworthy of an association occupying the conspicuous position of a model of American state medicine to be reïnscribing and endorsing the antiquated theoretical formulæ for the causation and evolution of epidemics by ordinary putrefactive fermentations, peculiar (common) meteorological conditions and other familiar agencies which have prevailed for a thousand years in a thousand favorable localities, before either cholera or yellow fever were known to the human race, and which have been either entirely absent or strangely dissimilar where these formidable maladies have been most extended and most fatal.

For these reasons, also, I became the principal actor in the reconsideration and tabling of the resolutions declarative of the noncontageousness of yellow fever. They were, under any circumstances, entirely unnecessary, for the whole tenor of these proceedings is in repudiation of the present theory and practice of quarantine, and in direct opposition to the communicability of cholera and of yellow fever. Apart from a beneficial moderation of the long restraints often unnecessarily imposed upon crews and passengers, I anticipate no useful practical result from the proposed substitute recommended by this convention. the invariable detention and purification of all ships arriving between the first of May and November, without any discrimination, is a useless trammelling of commerce, attended with no little increase of unnecessary and expensive procedures.

Justice compels us to acknowledge the value of the excellent practical suggestions adopted by this convention on the sanitary condition of ships and cargoes and of crews and passengers. This important and interesting subject of naval hygiene is beyond the jurisdiction of the State and muuicipal corporations represented in this convention. The Congress of the United States has already, by the act of March, 1855, contributed largely towards the objects specified, and will be readily influenced by the proper represeutatives of our great commercial communities and by the presiding officers of our boards of trade to pass such additional acts, as will render every ship that sails under the American flag, whether it is at sea or in port, clean, dry and well ventilated. This, as I conceive, is the only method by which any system of naval hygiene can be established that will be practical and uniform. It cannot be effected otherwise by the coöperation of all of the bodies represented in the future meetings of this association.

Few have devoted much attention to the history of quarantine who repose much confidence in its protection. The system is more opposed than the principle. Our large cities, while they close all the approaches by sea, leave the other avenues perfectly unguarded. Along miles of accessible coasts prevail contraventions fatal to the objects of quarantine, while the reïterated charges of deceptions, negligence and abuses, weaken its claims upon public confidence.

The repeal of all quarantine regulations by England and by some of the Eastern States not subject to yellow fever, should exert no influence upon those who dwell within the limits exposed to its visitation. The institution of quarantine by the State of Louisiana after the great epidemic of 1853, was a proper and laudable experiment. The law subserves every practical requisite, let it be faithfully executed. So long as it appears to succeed it should be sustained, when it fails, we hope that the authorities will not remain satisfied with this solitary public effort for the protection of public health. Where quarantine regulations do generally obtain there is a manifest propriety and necessity for uniformity. If, in the opinion of this convention, they are of limited value, I can discover no necessity for another session. Having made an attempt to change the title to that of Sanitary Conventiou, we have an evident indication of the future objects. The institution of uniform sanitary regulations in all the great cities of this country is unnecessary and impracticable, for no advantage is to be anticipated from a coöperation by which localities, differing in every attribute of climate, soil, elevatiou, drainage, maladies and hygeinic facilities should be subjected to the same sanitary ordinances.

I willingly sustained every sanitary provision submitted to the action of this convention, and will equally advocate every measure emanating from yourself, or from the city council, intended to augment the resources of the Board of Health. The condition of New Orleans is susceptible of great melioration, which can only be attained by more efficient means for inspection, and for the prompt execution of the present and future sanitary regulations. Moisture, I have always contended is our most hostile element, it is mainly by its reduction that we can hope to arrest putrefactive fermentation and its noxious exhalations. Instead of attempting to wash out our gutters by the present inadequate supply of water, wherewith they are regularly flooded for stagnation and deleterious putrefaction, every available means should be adopted for keeping them dry. The dust should be carefully swept from the paved streets, (all streets should be paved) instead of having it raked up into wet and reeking piles. The bridges, which during our frequent rains operate as the most effective dams and filth traps, should be entirely removed from the higher parts of the city, and so much widened in the lower, as to offer an unobstructed and rapid descent to currents of water of which the eddies now cast cart loads of foul mud at every corner of the streets. Every privy in the city should be thoroughly cleansed on the approach of hot weather. Their wells should be made water-tight to prevent impregnation of the soil, and water closets should be entirely prohibited until we have a good system of underground drainage. I am informed by Dr. Rushton, now a member of the board of health, that there are plans for the last purpose proposed by eminent engineers of this city, simple, feasible and by no means expensive when estimated by their universal convenience, and their indispensable service in promoting the sanitary condition of the city.

The board of health should be clothed with full powers to enter and take possession of every infected district on the apparent inception of an epidemic; to make a proper disposition of the occupants; to fence it around and cut it off from communication with other parts of the city, and to wash, fumigate, pull down and burn everything therein capable of maintaining or spreading disease.

The origin and propagation of yellow fever are topics so vitally associated with every interest of our southern cities, that there are few subjects more familiar to our citizens of every class, who according to their various convictions, maintain one or another of the exclusive opinions existing among the members of the medical profession. The larger proportion advocate the doctrine of its local origin, attributing to heat, moisture, filth and putrefactive fermentation, the whole series of pheno mena necessary for the production of this disease, which may either operate by themselves, or be called into action by the opportune arrival of a foul ship with a foul cargo. A smaller, but equally respectable party, who since the days of Rush have been somewhat opprobiously termed "contagionists," believe that yellow fever is of foreign origin, and transportable from place to place by ships, merchandize, baggage and individuals. While a third party, disregarding such apparently simple and matter of fact dogmas, have imagined a combination of certain earthy, watery and atmospheric elements with peculiar meteorological conditions, of which one conjunction generates yellow fever, and another conflux cholera. With all due respect for the authors of this very improbable hypothesis, I am compelled to maintain that it is a premature deduction from a very limited series of observations.

As regards the two prevailing doctrines of the local and of the foreign origin of yellow fever, it is a reasonable interrogatory why they should be held so absolutely incompatible and antagonistic, that its production by one must necessarily exclude its propagation by the other. Neither party pretends to indicate the real and essential nature of the morbid agent. If, as some contend, this be a minute cryptogamic or fungous vegetation, why cannot it be transported? Why may it not lie dormant for an indefinite period to be developed by the local causes which they invoke? If the germs be animalcules, why cannot they multiply and be transported? If the cause be a special fermentation, why cannot the leaven be subject to the same diffusion that is characteristic of similar ferments? This is something beyond a mere scientific question—it is a momentous question, involving the most responsible of all issues; and how, in this aspect, any man or any convention of men, in the conflict of so much respectable testimony can find confidence enough to declare that one or the other is the only correct doctrine, or that there is not much truth in both, is more than I can possibly comprehend.

Should a query be proponnded in this connection, whether the same disease may be at one season communicable and at another not, I will respond that there is good evidence for an affirmative answer, that diseases, pathologically among the most simple, may, by a variation of morbid elements, become epidemic and even contagious; that small pox, measles and scarlatina, the most contagious of maladies, may exhibit extraordinary degrees of communicability, both in periods of time and in places, remaining long dormant in the one, prevailing so diversely in the other, that there are portions of the earth they have never invaded.

We are thus induced, however, to contemplate this subject in another

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aspect. Is yellow fever always the same disease? Is there more than one type? Have we an epidemic form generated by the action of local causes, and not capable of being carried beyond the limits of the city in which it originates? Have we an epidemic and contagious form which travels in wider circles, and is transportable independently of mere local conditions? I, myself, have no hesitation in declaring that yellow fever is subject to great variations, that we have two very characteristic types, and that the ordinary or endemic and the epidemic forms as they have prevailed in this city, are as distinct in their symptoms as they are apparently in their origin, development and mode of propagation.

The fever of 1853 differed in many important particulars from that of our previous experience. It appeared nearly two months in advance of the ordinary period, and long before the local causes to which it had been hitherto generally attributed, had full time for their operation. It presented characters so novel and peculiar in this region, that many experienced medical gentlemen called it not the yellow, but the pernicious fever. Native children, seasoned residents, and negroes heretofore subjected to it only in the simple and least malignant form, suffered and died with it in large numbers. Instead of terminating favorably or otherwise on or about the fifth day, its duration was generally more protracted, and it ended fatally on any day thereof from the first to the twentieth. Relapses were very frequent; many who were apparently for several days in full convalescence, having an unexpected return of the most dangerous and fatal symptoms. The fever was not of one paroxysm, but generally more or less remittent, and often at the end of from four to seven days assumed a secondary nervous and protracted character, terminating like our secondary exanthematous fevers by elimination in abscesses, boils and carbuncles. Delirium and other grave nervous symptoms in adults, with convulsions in children, appeared often on the very inception. The whole intestinal canal was in most cases inflated with gas from the second day. The urinary secretion in the worst cases remained copious to the last. The bodies of many, particularly of the children who died, never turned yellow, and while the general mortality was unprecedented, the number of recoveries from black vomit was greater than I have ever witnessed before. To the unprofessional as to the medical man, the most uncommon feature in this epidemic was its extension into villages, plantations and the healthiest, dryest, most barren and insulated spots of this and of the neighboring States, where no terrene exhalations could either be suspected or proved to exist, and that during the absence of the most prominent meteorological conditions so constantly invoked to explain its mode of propagation. The most indisputable and direct testimony, both professional and otherwise, has been adduced to prove that the fever conveyed to many such places by the sick and by fomites, was widely propagated. I know that I can safely assert that a large majority of my respectable medical associates in this city, have expressed a conviction of the truth of these statements, so antagonistic to our former doctrines. The report of the sanitary commission appointed by the council in 1853, abounds in direct and positive testimony to a similar effect, both by letters and otherwise, from the most respectable sources, which has been most contemptuously ignored by its principal and most voluminous author. No unprejudiced man can rise from the perusal of the history of the inception of that epidemic, almost entirely given by those opposed to its contagious propagation, with the conviction that it was clearly of local origin. I appeal to the published histories of every epidemic that has visited this continent, to prove the impossibility of procuring undisputed evidence concerning the exact points and modes of their incipience and propagation in large cities. I will offer in illustration, one of our ordinary diseases. We have two forms of continued fever, typhus and typhoid, which are held by some pathologists to be, like endemic and epidemic yellow fever, identical diseases of different types, and by others, to be affections entirely distinct. The typhoid fever, after prevailing for many years in Paris and in the other great capitals of Europe, was held to be non-contagious by several of the most eminent physicians. The sources of its propagation in large cities were too diffused and multiplied to be satisfactorily determined. Immediately that its progress was faithfully traced through villages, farm houses and other insulated places, where the alleged local causes of its production were reasonably supposed to be absent, its contagious nature was well established and generally credited. By a similar series of observations, I maintain that the communicability of yellow fever has been successfully demonstrated, and that the same mode of propagation by which it has certainly progressed from the city outwards, would be equally capable of bringing it in.

I am fully sensible of the unusual length of this communication, which I hasten to terminate. Had the author of the principal portion of the late sanitary report seriously predicted the epidemic of 1853, why was he absent when it prevailed—why did he not warn the unprotected of the impending calamity? In my opinion, the philosophical physicians who watched with apprehension the extending ravages of the fatal epidemic, which for four years had been sweeping from the Brazils to the shores of the Gulf of Mexico, might have more safely predicted its inception in New Orleans from a tendency to dissemination, than from any amount of earth that was thrown up a mile from the place of its inception, or from any peculiar meteorological conditions which have only been pretended to be established in one portion of its wide and fatal range.

There are facts in the history of our epidemics which the hypothesis of local origin does not embrace. We are compelled to invoke other agencies for a more logical rationale. There must be also an extraordinary epidemic influence, and some novel and doubtless contagious mode of propagation. I therefore insist, that we ought to observe every precaution that can abate the local conditions alleged to be productive of yellow fever; that we are equally bound to maintain a strict quarantine so long as it is proved to be useful; and that we ought further to insulate and purify every part of the city in which this disease first makes its appearance.

A proper regard for the welfare of that numerous class of our population, whose limited circumstances oblige them to remain exposed to all of the perils incident to our frequent epidemic visitations, should compel us to employ some efficient method of relief. What amount of sickness and of mortality might not be averted from this useful but unfortunate position of society, by a judicious application of the very sums now disbursed for the expenses of their illness and interment. Humanity should not alone induce us to adopt some wise and liberal project for their removal on such occasions to a safe distance from infection—it is, in my opinion, the most politic system whereby to curtail the black catalogue of mortality forever impending over the reputation and prosperity of New Orleans. We cannot, farther, too emphatically invite attention to the heedless disregard of every impulse of humanity, by which hordes of ignorant immigrants, peculiarly susceptible to epidemic influences, are permitted to enter within the very foci of infection, the majority of whom, merely passengers in transitu to the west, have no other claims, beyond those of their necessities and afflictions, upon the generous community burdened by their charge, and compromised by their fearful accessions to its mortuary reports.

Although my resolution on these important points was favorably received by this convention, I regret that it did not propose some stringent enactment by Congress for the better protection of raw immigrants, and for the security of communities hazarded by their debarkation.

New Orleans, in common with our other southern cities, has been in every season the invariable victim of credulous and unprincipled letter writers, who manufacture for foreign circulation the most unfounded and diabolical reports of its mortality and insalubrity. These, while operating in many ways injuriously to her interests, have been made, it is said, the plea for quarantining her vessels and unnecessarily and ruinously obstructing the course of her commerce. By the advice of several of the eminent delegates to this convention for the adoption of uniform quarantine and sanitary regulations, it was deemed a proper occasion for the introduction of the two resolutions recommending that no unfounded reports or rumors indicating certain ports or cities as the seats of epidemic diseases should be the basis for action elsewhere, and providing farther, that all boards of health and other public authorities should be obligated to declare not only the existence of cholera and of yellow fever in their epidemic, *but also in their sporadic forms*, in the localities under their control. The words italicized, which were intended to secure faithful and reliable evidences of facts the most interesting to all concerned, both at home and abroad, have been inadvertently omitted by the excellent secretary of the convention.

In conclusion, permit me on this occasion to acknowledge the honor conferred on me by the nomination to this convention; to bear willing testimony to the courteous disposition of the eminent gentlemen who attended it; and to render to the majority of the Philadelphia delegations, and to those of Boston, Baltimore and Norfolk, the highest respect for the eminent position which here, as elsewhere, they have universally occupied.

Your obedient servant,

New Orleans, October 1, 1857. JAMES JONES.

ART. VII.—*Abscess of the Brain:* By YELVERTON B. EGAN, M. D.

IN the month of February last, I was requested to visit a female child on Dr. W.'s plantation, whose age was 18 months.

I found it suffering from otorrhœa of the left ear, which occurred from an accident during delivery. I was informed that the mother, during the pains of labor, left her bed, and while in the act of running across the floor, the child fell from her.

When I saw it, it was well grown, but had an expression of countenance which indicated considerable suffering, although it never had convulsions or paralysis until within a few hours before death. When nine months old it passed through an attack of measles, but without any apparent effect on its disease.

I prescribed a simple injection, which had the effect of stopping the discharge from the ear, but it was followed by a venous hæmorrhage which occurred three times during an interval of five or six days, and then terminated in death.

Autopsy: Upon removing the skull-cap, I found on the diseased side (the left,) the three membranes of the brain completely blended together; on cutting through them, an abscess extending from the petrous portion of the temporal bone to the apex of the middle lobe, and forward to the fissure of silvius, extending downward to the corpus callosum, with nearly complete disintegration of the posterior lobe, leaving a mere shell to cover it.

Pointe à la Hache, La., Aug. 15, 1857.

ART. VIII.—*Hydrocele; Operation; Cure:* By GREENSVILLE DOWELL, M.D., of Columbia, Brazoria County, Texas.

NEGRO man Ben, *æt.* 63. General health good. Was sent to us for cure of a hydrocele of long standing. He says he was taken with it some twenty years since in Mississippi. That he was operated on by a physician in that State. That he injected a red fluid into the sack, after he drew off the water. That it made him very sore but did not cure him, as the water soon refilled the sack, and he was as bad as before the operation. He has been operated on some seventeen times by puncture; it having been necessary about every six or eight months.

June 18, 1857. The dropsy is in the left side of the scrotum, which is now so much distended and enlarged, that he can scarcely reach around it with both hands. In consultation with my partner, Dr. R. R. Porter, we determined to operate on him for a radical cure, and owing to his age and the great accumulation of water, we thought it best to use a seton. Thinking that the injections would fail to perfect a cure, Dr. Porter operated as follows: Seizing the bag with his left hand, he passed a trochar into the sack and out, again withdrew the trochar and left the cannla in this situation until a silk braid was passed with a probe through the canula. This done, the braid was held until the canula was withdrawn, so as to let off the water. After the water was all drawn, the two ends of the tape were loosely tied so as not to cut with the anticipated swelling of the sack. The tape was left in for eight days, by which time the sack had swollen nearly to its usual size, and was quite painful and began to discharge pus and water. It was bathed with sugar of lead and a solution of morphia. After the fever had somewhat abated, used tincture of iodine. The bowels were kept open with Epsom salts, and occasional doses of calomel and ext. of taraxacum. For nearly two months the sack discharged pus and water, gradually getting smaller and less painful. He suffered from no inconvenience during this time except the discharge and soreness of the sack.

He is now (Sept. 20th) entirely well, his testicle being of the usual size. He bids fair to live twenty years yet, and the owner says he is worth $200 a year, having saved that much to the plantation since he had got well.

Art. IX.—*Researches into the Sanitary Condition and Vital Statistics of Barbarians:* By Bennet Dowler, M. D.

In order to restrict this paper as much as possible, consistently with its purpose, only a small portion of vital geography will be glanced at through the medium of the most recent and reliable observers, who have personally witnessed the facts which they relate.

Amiable but speculative philosophers, smitten with admiration for the primitive life and manners of the houseless nomade or savage hunter, have sometimes been led to distrust or even to deny altogether the benefits of civilization. A remarkable example of this bias in favor of the superior sanitary advantages, vital progress and supreme happiness of savages, is displayed in the works of Dr. Rush in his essay entitled, "*An Inquiry into the Natural History of Medicine among the Indians of North America; and a comparative view of their diseases and remedies with those of civilized life.*"

Vital statistics, a science of recent origin, proves that neither the ancient philosophers who declaimed against the corruptions of wealth, nor the modern grumblers who declaim against the luxurious civilization now extant, can justify themselves and their theories by indubitable facts. Neither personal nor national poverty is favorable to the health, longevity, increase, or well-being of man.

Dr. Rush's opinions, so favorable to savage life, are refuted by an exuberance of modern testimony. These opinions will be tested chiefly by the Medical Statistics of the army lately published. And although these official reports serve to illustrate the subject under consideration, yet apart from the latter, they are in other respects highly interesting, to the philanthropist, physiologist, and physician, as will be seen in the sequel.

Dr. Rush, it would seem, was led by the writings of Charlevoix and others, to form an ideal of the Indian almost as extravagant as that which has since been more fully developed in the gorgeous fictions of Cooper, and in the poetry of Longfellow, not to mention Catlin's flattering delineations. The search after the poetical element in the Indian character is a hopeless task, even if M. Tocqueville's standard of poetry be admitted to be just, namely, that the art of poetry consists in the suppression of a part of what exists, the adding of imaginary touches, the combining real circumstances which in fact do not concurrently happen, the object being not to represent truth, but to adorn it with lofty imagery. Such a standard cannot be accepted in physic.

Dr. Rush asserts that "the treatment of children among the Indians tends to secure their hereditary firmness of constitution, etc. Nature is their only midwife. They know nothing of the accidents which proceed from the carelessness or ill-management of midwives," etc.

"The state of society," says he, "among the Indians, excludes the influence of most of those passions which disorder the body. The turbulent effects of anger are concealed in deep and lasting resentments. Envy and ambition are excluded by their equality of power and property. Nor is it necessary that the perfections of the whole sex should be ascribed to one, to induce them to marry. Thus they are exempted from those violent and lasting diseases which accompany the several stages of such passions in both sexes among civilized nations. There are no deformed Indians. Fevers constitute their only diseases. I have not been able to find a single case of fatuity among them. Nor is dentition accompanied by disease. They appear strangers to diseases and pains of the teeth. If their remedies are simple, they are, like their eloquence, full of strength," etc., etc. In this strain Dr. Rush proceeds to compare the savage and the civilized states, giving the former a strong *couleur de rose*. The evils of modern civilization he depicts in dark colors, as a panorama of ghastly maladies, a realm of death.

Before proceeding to offer recent documentary evidence adverse to this Indian utopia, it may be proper to remark that, although the doctrine of hybridity cannot be positively affirmed as inherent in any variety or fusion of the human species, yet some physiologists think differently, and, such would seem to be the import of a portion of the first army report which follows, and which, however, it may be in vital statistics, is quoted to show the state of medicine, etc., among the Indians, as being little accordant with the picture drawn of them by Rush of blessed memory.

Dr. Day's communication is dated July 5, 1852, at the Winnebago Agency, which accompanies Assistant-surgeon Head's report, and contains the following conclusions concerning the vital statistics, etc., of the Winnebagoes, together with his observations upon the mixed breeds generally, in the North-western territories of the United States. Dr. Day says:

"1. That the mortality is greater among these Indians than among the white race, and somewhat higher than in the worst class of the negro population of the United States. 2. That the average age at death is much less than in any other class of the American population. 3. That in the early periods of life the mortality is far greater than in the corresponding periods of any other race. 4. That the proportion of births among these Indians is greater than among a corresponding number of any other people. 5. That this tribe has not diminished in numbers within the last three years.

"Since my acquaintance (now some seven years) with the population in the North-west, of mixed white and Indian blood, I have made the following observations, which I believe may be set down as facts: 1. That a mixture of the white and Indian races produces an offspring of less physical and moral force, and of less viability than either of the original races. 2. That the offspring of this mixture of the two races is a *hybrid, and incapable of propagating itself beyond the third or fourth generation.*

"So long, however, as one of the parents is of pure white blood, the offspring may be, to a certain degree, healthy, but it is not generally vigorous; but when both parents are of mixed blood, the offspring is nearly always scrofulous, feebly developed, and generally dies before the accession of puberty. I have never known an individual, whose parents were *both of mixed blood, live to old age.*"—63.

"The large percentage of deaths occurring in the early periods of life among these Indians, is abundantly accounted for by the Spartan treatment to which they are subjected in infancy. As soon as an infant is born, it is laid on a board, previously covered with a few folds of blanket, then, with a strip of cloth two or three inches wide, is as amply and securely bandaged from head to foot as an Egyptian mummy, and then strapped to the board, care being always taken to include the arms which are extended upon the sides of the infant, and leaving nothing out of the bandage but its head. In this straitened position they spend the greater part of the first year of infantile life, remaining at times for weeks without being taken from the board. The effect of this cradle (?) with the heavy woollen bandages, is to interfere with, if not entirely preclude, the healthy functions of the skin. The excrements of the child's body collect, excoriating the skin, and keeping up constant irritation. The motions of the limbs—the only voluntary ex-

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ercise an infant can have, and one so necessary to the development of its physical powers—being entirely precluded, it soon becomes weak and enfeebled. But the most pernicious effect of strapping their infants upon these boards is exerted upon the brain. Being always laid upon their backs, with little or nothing between the hard board and the imperfectly ossified head, the continued pressure exerted by the weight of the head, almost universally produces a displacement of the occipital bone inwards, causing trismus nascentium, paralysis, etc., and deranging the functions over which the cerebellum presides. They think it a mark of great comeliness to have the head perfectly flattened behind, and the Indian mothers show much anxiety in this respect. It is wrong to suppose Indian children better capable of surviving less careful treatment in infancy than those of whites. The former are generally born with less vigorous constitutions than the latter; and taking into consideration the numerous causes of disease and death to which the forest children are subjected, the wonder is, how *any* survive—not why so many die."—64.

"An Indian will generally survive a greater bodily mutilation than a white man. This has been attributed to the simplicity of their diet. It is, however more probably the consequence of a lower degree of organization, and less delicate sensibility of the nervous system. The diseases incident to the female organs of generation are extremely common, especially prolapsus uteri and leucorrhœa. The former of these complaints, amounting in many instances to complete procidentia, is so frequent, that a majority of all the women who have borne children are affected with it. Nor is this surprising, when the ill-treatment to which their parturient females are subjected is taken into consideration. They never maintain the recumbent position an hour after delivery, and generally return within a day or two to the labors of the corn field, or to the carrying of heavy burdens, and performing all the laborious duties usually assigned to the squaw. An Indian woman can no more violate, with impunity, the obvious hygienic treatment necessary to the parturient state, than a white woman. The progress of parturition, among Indian women, does not differ in any material respect from the same process in others; except, perhaps, in being somewhat shorter, and attended with less suffering, which I believe to be owing rather to a low degree of nervous sensibility, than to any material physical difference."

Assistant-surgeon, Alexander B. Hanson, in his report dated in 1856, on the topography and diseases of Fort Ridgely, lat. 44° 30′ N., lon. 17° 45′ W. of Washington, situated at the junction of the Minnesota and Rock rivers, says that the Sioux Indians "sometimes resort to the external and internal use of various herbs, scarifications of the surface, and the vapor bath. Their principal reliance, however, in severe cases, is placed upon the conjurations of the 'medicine-men.' These proceed to the patient's lodge, usually at night, where they chant, beat their rude drums, rattle their gourds, and perform other magical rites. At a given signal they discharge their guns through the entrance of the lodge at the disease, or evil spirit, as it passes out of the body of the patient. But usually it returns again and again; and night after night it must be drummed out, until it is entirely banished, or, proving too strong for its opponents, it kills its victim.

"Their word, inadequately rendered '*medicine,*' is vaguely applied to every incomprehensible, mysterious, and, therefore, in their belief, spiritual influence. Dr. Daniels, the physician who resides among them, tells me that they have an almost idolatrous reverence for opium and chloroform, the 'great medicine.' The doctor and myself had occasion to perform several operations in which we used chloroform, the fame of this medicine soon spread abroad among the neighboring Indians.

"As in all primitive communities, the functions of priest and physician are based alike upon the supernatural, and constitute a single profession, of which the sages or 'medicine-men' are the exponents. The candidates for the honors of this fraternity are initiated within the medicine lodge, from which *laymen* are excluded.

"Very old persons are seldom seen among them; there is no doubt that a very large number of children fall victims to the 'hardening process,' to which they are unavoidably subjected, who, in civilized life, would have been reared to useful maturity. The diseases attendant upon privation and exposure are the most common among them, as phthisis, scrofulous affections, rheumatism, dysentery, diseases of the ear and of the eye.

"If civilization has made so little progress, Christianity may be said to have made none. There have been one or more missionary establishments among these Indians for the last twenty years. At the mission on the Yellow Medicine river, there is preaching every Sunday in the English and Dacota languages, and a day-school, in which Indians may be taught to read the Bible in their native tongue. But besides the white and half-breed employees of the Indian department, and their families, there are few or no attendants, either at school or meeting. The Indians themselves seem perfectly indifferent, and practically ignore the establishment."

Assistant-surgeon, S. Wylie Crawford, (1853) in his report on the medical topography and diseases of Fort M'Kavett, says of a band of

Comanches, that "the great majority die of pneumonia and affections of the chest. They are indolent, and, with few exceptions, physically weak. I believe the majority of the men die before forty. The women live longer. Their food is often insufficient. They sometimes live for days upon the fruit of the *carya olivæformis*, and frequently come into the post in almost starving condition."

Assistant-snrgon, Israel Moses, (1852) in his report on the medical topography and diseases of Astoria, thus characterizes the Indians of the Pacific region of the United States, or Washington and Oregon territories: "All these several tribes speak the same language, follow the same cnstoms, and resemble each other in manners, dress and person. The decay of the Indian tribes along the Colnmbia [river] has been fearfully rapid. A robust and numerons people, they have disappeared almost as by the wand of a magician. A severely fatal epidemic of measles carried off nearly half of the tribes in 1829 and 1830, which was followed by a congestive form of intermittent, that has appeared at various times, and created great havoc; but the scourge of these nations has been syphilis, and its sequent, scrofula, in the most fatal forms. Ignorant of any curative means, vast numbers have died from the primary disease, while in its secondary and transmitted forms, generations have perished unborn; glandular and eruptive diseases have carried off the infants; tnbercular phthisis blighted their youths and brought their young men and matrons to premature old age. It is remarkable that very few can be fonnd among the men who have not lost one eye by ophthalmia (syphilitic or gonorrhœal). Many are absolntely deformed by enlargement of the cervical glands, freqnently suppurating, discharging, and forming frightful cicatrices. Hare-lip and cleft palate ore often seen; the idiopathic, and severer forms of malarial fever almost never. Abortion is common, and not unfrequently bronght about intentionally. Child-bearing is a no more easy nor less dangerous process than among other females, etc. Should any abnormal circnmstance arise, the child and mother, or most frequently both, are sacrificed. The infant immediately after ablntion, is straightened out, tight swathed, with arms inclnded, and placed on a board to be snbmitted to the process of flattening of the head. This is effected by pads placed over the frontal bone, inclining from the superciliary arch to the vertex; counter pressnre being made by a pad under the occipital bone. The pressure is maintained during one year, when the bones having sufficiently ossified to retain the desired shape, the pads are removed. Infants do not appear to snffer by this pressure, which is kept np day and night; they nnrse well and sleep comfortably. Among certain tribes side-pads are used so as to render the head pointed; but this is not followed by the Chinooks.

"In ordinary cases of sickness the aid of the medicine-man or doctor is called in. This individual is held in high estimation, and demands large fees for his advice and services; these are given at a vast personal risk, and somewhat upon the terms of their advertising professional brethren in large cities. Upon visiting the patient, and receiving his fee, the doctor goes actively to work to drive out the evil spirit from the suffering body, where it has assumed the form of a wolf, a beaver, or a large stone. The friends having formed a circle, a low and solemn incantation is commenced, accompanied by the regular beating of small sticks of wood, and gradually swelling in tone and rapidity of utterance until it becomes a howling, yelling, frightful succession of sounds. The doctor sitting at the bedside, swaying his body to and fro, keeping time to his song of invocation, begins to press and knead the breast and abdomen. As he becomes excited, he jumps up and dances about the lodge, with constant and most fatiguing gesticulation of the head, arms, legs, and body, until he either becomes frantic by excitement, or falls exhausted. Having by this time arrived at a just appreciation of the shape of the disease, he retires from the lodge, and after a suitable interval returns, and in a most dignified manner resumes his position and song. When thus a second time the necessary pitch of excitement is attained, he suddenly thrusts his hands beneath the blankets, and to the surprise, delight, and admiration of the assembled friends, jerks out, and casts among them, a dead wolf, serpent, beaver or stone, having thus successfully combatted the disease. Should the unhappy victim of Æsculapian art fortunately get well, the doctor remains in peaceful enjoyment of his professional gains. Should death, however, have knocked at the door of the lodge during these mockeries, as he invariably does in severe cases, the doctor has not only expended his time and labor for nothing, but now has forfeited his life by failing to restore his patient to health. If he can compromise the matter with the relations and friends of deceased, by paying his value, estimated in horses, blankets, canoes, or slaves, he redeems his own life."

Assistant-surgeon, J. M. Haden, (1853) in his account of the medical topography and diseases of Fort Steilacoom, lat. 47° 10′ 57″ N., one mile east of Puget Sound, says: "There are very few white settlers in this vicinity, and, so far, there have been very few cases of sickness among them. But with the Indians the case has been far different. They seem to be passing away so rapidly before civilization, that but very few years will elapse before they are entirely extinct. Wherever the whites settle, they disappear as if there was something in civilization incompatible with their existence. They say themselves, that in a few more 'colds,' they will all have disappeared. They seem to possess very little stamina, and when disease once takes hold of them, they very soon succumb. During the summer months they are comparatively healthy, but during the winter great numbers die of dysentery and of pulmonary diseases. Since 1844, dysentery has been of annual occurrence during the autumn and winter months. Influenza prevailed as an epidemic in the autumn of 1851, and proved very fatal among some of the tribes. Syphilis and gonorrhœa exist to a great extent among all the tribes known to the whites. All the tribes on the Sound prostitute their women without hesitation, for gain, and healthy children among them are very rare. The scrofulous diathesis is very common, and great numbers die of phthisis pulmonalis. I have known almost entire families die of that disease within the last three years. One fruitful cause of disease among them, I think, is their manner of dressing. Very frequently an Indian may be seen one day dressed with coat, pants, two or three shirts, cap, and blanket, and, as they are inveterate gamblers, the same Indian may be seen the next day with no other covering than a shirt. In the treatment of disease they use a few indigenous medicinal plants, but their chief reliance is in the powers of their 'medicine-men,' whom they believe have the power to cause and cure disease. Almost all deaths are ascribed to the supernatural agency of some one or other of their 'medicine-men,' who are frequently assassinated by the friends of the deceased. The 'medicine-men' seem to have full confidence in their medicine, and they are generally regarded with great fear by the members of their tribe. An old practitioner in this vicinity boasts that he has had many enemies, but that his medicine has swept them all away."

Assistant-surgeon, Rodney Glisan, (1854) of Fort Arbuckle, lat. 34° 27′ N., four miles south of Washita river, and 76 miles north-west of its junction with Red river, says the roaming bands of Kickapoos, Witchitas, Keechies, Caddocs, Wacoes, Creeks, Cherokees, Delawares, Chickasaws, and Choctaws, "are almost universally afflicted with malarious fevers and their effects. I have seldom seen a case of intermittent fever among them without an enlargement of the spleen. Enlarged and indurated liver, and dropsy are by no means rare—all attributable to the frequency and long continuance of the disease."

Assistant-surgeon, John E. Summers, (1852) of the military post at San Diego, California, says that since 1840, the Indians of that place have been reduced from 800 to 300 or 400. In 1843, the small-pox killed much more than half of the Indians on the coast of California.

George Suckley, M. D., of the Eastern division of Exploration for a route for the Pacific railroad, in his report to Gov. Stevens, dated Jan. 4, 1854, at Puget Sound, (p. 178) says that the Indians east of the Rocky Mountains suffer from inflammation of the eyes and consumption. "The Indians on the Columbia river, below Fort Colville, are rapidly becoming depopulated by the small-pox, intemperance and syphilis. During the past summer, the Lakemans and Wyampums buried more than half of their numbers."

The above described artificial malformation or flattening of the back-head, might be expected, upon phrenological principles, to obliterate or modify the organs or bumps appropriated to the animal propensities, as amativeness, philoprogenitiveness, etc. Yet these effects have not hitherto been observed from the flattening of the heads of savages during infancy. The phrenological differentiation between the flat-head Indians and others has not been established.

The great prevalence of consumption among savages, greater probably than is ever witnessed in civilized life, appears evidently due to the absence of the physical comforts, scanty food, defective clothing, bad lodging, quackery, etc., which tend to augment the ratio of mortality from this most fatal malady.

Physiologists find it difficult to explain the apparent incompatibility of the civilization of the Caucasian race to the condition and nature of the other races. Neither the Asiatic nor the American Indian readily yield to its influence, which, indeed, they generally repel, or if they do not repel it, they do not improve by it, but rather degenerate with an accelerating ratio.

By passing from the North American Indians to their antipodes, say Borneo and Abyssinia, not to name continents, the following tableau will show a striking parallelism in vital statistics, medical superstition, degradation and misery.

An Englishman, Sir James Brooke, who obtained the Rajahship of Sarawak, and an almost supreme power over the coast of Borneo for 700 miles, in the second volume of his Journal, (London, 1848) gives the following interesting account of his adopted people, and the benefits which they derive from a civilization repulsive to their natures. Mr. Brooke, who, at first unassisted by his own government, labored to civilize these barbarians of the Eastern Archipelago, killing them in war and ruling them in peace, naïvely asks: "Is it not sad to think that kingdoms are laid low, and the inhabitants oppressed and dispersed, whenever they come within the grasp of European civilization? How painful the reflection, that, wherever the white man has set his footmark, there the print of the native foot is obliterated, and that as a tender plant withers beneath his tread, so wither the aboriginal inhabitants of the soil! Yet so it is; crime and misery, oppression and death have ever followed. At this day not one powerful Maylay exists, and the people are verging towards extinction.

"We have the picture of innocent, and of comparatively happy, nations—nations prosperous and hospitable, confiding in the honor and integrity of Europeans. We seek them, and they are no more. Whole nations have been extirpated; their arts and their very language lost in the march of this monster colonization which now is to confer every benefit. Our boasted territory in India, the best and most uprightly governed of any European possession—what advance have the people made during the long period of our sway? Are they more civilized than in the time of Baber and Akbar? Are their minds more enlightened? their political freedom more advanced? their religion less dominant or less bigoted? No. The mass are as ignorant as ever, as low as the African! Who that compares the states of the Peninsula, Java, Sumatra, Borneo, or Celebes, before and subsequent to the period of European domination, but must decide on the superiority of the former?"—(i. 12, 68, 69, 70, 71).

This very significant and sagacious statement made in 1848, is fully confirmed upon the ensanguined plains of India, where a few thousand Englishmen who have hitherto ruled more than one hundred millions of natives, are at this moment enacting one of the most horrible dramas known in history, in order not only to recover their authority, but to avenge themselves for the most savage indignities and indiscriminate butchery of men, women and children of the white race, blowing to atoms from the mouths of their great guns the disloyal, captured Sepoys.

Dr. Charles Johnson, M. R. C. S., (of the British Embassy at Shoa) in his *Travels in Southern Abyssinia through the country of Adal to the Kingdom of Shoa*, (2 vols. London, 1844) gives an account of the people of the countries through which he travelled or sojourned, from which it appears that the healing art corresponds to the low grade of civilization in that country—the lowest grade that claims to be in any degree christian, though strongly tinctured by Mohammedanism.

Dr. Johnson says that the most distinguished chiefs among the Bedouins, as Carmel Ibrahim, for instance, cannot, assisted by small stones, count as high as thirty.—(i. 372) The North American Indians cannot count much farther.

Dr. Johnson advises physicians traveling in the East, when called on for medical advice in bad cases, to prescribe a certain number of prayers to Allah, or to give some written charm, "but never by any means administer medicine or perform the least operation, as the cure is always ascribed to Allah alone; but should the patient die, the doctor is considered responsible for his death, which is certain to be attributed to him or his medicines. To show how careful a person ought to be, I shall relate a little incident. A woman came for some medicine for her husband. I could not go to see him, as he lived ten or twelve miles from the Kafhilah. As the woman was very importunate for medicine, which, having no knowledge of the case, I at first refused; to get rid of her I opened a package of tea, and giving her a small spoonful, wrapped it up in a bit of old newspaper, and sent her away, with directions how to use it. The next morning, however, I found her making a terrible noise at the entrance of my hut, saying that her husband was a great deal worse, and all owing to the medicine he had taken. No one could understand the simple character of the remedy I had sent him, so all my explanations went for nothing, until I happened to see, sticking between her skin petticoat and her own black hide, the identical paper I put the medicine in, and snatching it from her waist, I found the tea still in it actually untouched. This evidence of the woman's imposture was conclusive, and she was taken away by those of her friends who just before were making loud demands of compensation for the injury they asserted I had done."—(i. 197). Dr. J. was obliged to avoid blood-letting upon the natives for these reasons: "I was prevented performing this operation by recollecting the case of an unfortunate Armenian doctor, who, in Suikin, two years before, had been sacrificed by the populace on account of the death of a patient whom he thus treated. The Turkish governor of the town, before whom the complaint was made of this treatment, in vain interceded in behalf of the doctor; his expostulations had no effect, and he was obliged to permit that which he was unable to prevent, and the accused was taken from his presence to the outside of the walls of the town, where he was barbarously executed in the usual manner, by the weapons of the friends and relations of his deceased patient." Mr. J. says this fact was officially reported by the European consuls to their respective governments, as well as to the Porte. (i. 397).

"Going nearer, to see what they were about, I was joined by Allee, who informed me they were doctoring Ohmed Mahomed, in their own fashion, by offering up prayers to Allah, and asked if I thought he would recover. As I had already given him three strong cathartic pills, and as his case was not a desperate one, I held out hopes to the distressed Allee, that probably the next morning his master would be quite well. Having approached the circle, and dropt upon my heels, close behind them, I watched the proceedings of these devotee practitioners in medicine, and noticed that each one, in succession, recited in a low voice the first chapter of the Koran, and spit upon the patient, who, wrapt in a black Arab cloak, was lying at full length upon a mat, in the midst of them. Every one having duly performed this ceremony, the circle broke up, and coffee being brought, the good effect of the combined praying and spitting was acknowledged by all, when Ohmed Mahomed sat up and called for the first cup. I have seen them adopt the same means of relief for a sick camel."—(i. 401–2).

Barbarians, who make war the business of their lives, are, nevertheless, compartively powerless when brought into contact with highly civilized nations, whose superior scientific skill ensures certain victory. This, alone, is an argument sufficient to prove the vast importance of civilization. Indeed, knowledge multiplies to a great and indefinite extent the power of a nation, together with an increase of its population, by means of the increase of the physical comforts, the increase of salubrity, the increase of longevity, and other advantages which civilization carries with it.

Many causes inherent in savage life combine to prevent the natural increase of the species. Mr. Catlin, a great admirer of the Indians, who spent eight years among forty-eight of their tribes, says that it is very rare for an Indian woman to have more than four or five children; they never have ten or twelve as in civilized life. (ii. 228).

The perpetual wars of barbarians, and their practice of killing their prisoners, tend to repress the natural increase of the species. Assistant-surgeon Hasson, in his official report, (1856) says: "That the essence of war is violence, is truly the Indian's maxim; and the chivalrous sentiments of civilized warfare are to him but foolishness. His principle is to exterminate the whole race of his enemies, or, as his sign forcibly expresses it, to *wipe them out;* and neither old nor young, women nor children, are exempt from his fury. Sometimes a woman or child is taken prisoner, and then their lives are at the disposal of their captors. About a year ago, a Chippewa girl was taken prisoner by a Sioux warrior; but not proving as completely submissive as her master thought desirable, he subjected her to much harsh treatment. Her sufferings excited the sympathy of a half-breed trader, who carried her off clandestinely, and brought her to this post [Fort Ridgely], whence she was sent to her own country. Her Sioux master has been annoyed ever since by the upbraidings of his band, and his own regrets, at his folly in sparing a Chippewa to become the mother of warriors that will battle against his race."—(Army Stat. 70).

The uucivilized negro in his native Africa, is either stationary or declining, while the negroes of the Southern States of this Republic increase in numbers faster, and present a sanitary condition more favorable than any other portion of the human race. Of the small number originally imported into this country, probably few would have representatives now living, had it not been for the benefits of civilization in which they are partakers, though slaves. Without admitting that the nltra advocates or enemies of African slavery have shown it to be the best or the worst institntion extant, it may be truly affirmed that it has advanced the physical well-being of the black race beyond any known parallel, and that the state of society in which the vital statistics of this race is most favorable, is that of slavery. Hence if mere theories, abstractions and dogmas be rejected, even provisionally, in order to deal with the facts which actually exist, it will be found that the psychical, vital, and sanitary conditions of the slave population as compared with their race at any æra in any other part of the globe, are immensely bettered, and further, that this amelioration grows out of the existing state of society in the sonth, be that good or bad, in which servitude is an element. So far the physiologist is concerned with the result, and must approve it as being the most luminous fact in the entire history of that race. He may wrangle on either side of the ethical question, and affirm according to his theory every virtue or every vice under heaven as inherent in the institution of slavery. The optimist is, of course, satisfied; and even the veriest ntopian feels the ground sliding from beneath his feet when the steady current of utility sets in against his sandy fonndation.

A slight geographical illusion may be illustrative of these views: Sierra Leone, the English colony of free negroes on the western coast of Africa, adjoining Liberia, founded in 1787, and peopled from time to time by blacks from London, Nova Scotia, the West Indies, from vessels in the slave trade captured on the high seas, and from other sources, contained in 1848 bnt 46,511 souls, more than half of whom were still heathens, notwithstanding the praiseworthy efforts of the Christian public of Great Britain to educate and otherwise aid them in obtaining the physical comforts, not only for their own sakes bnt that they might be the means of extending the blessings of civilization to the snrronnding nations of benighted Africa.

In 1819, no less a nnmber than 1,222 disbanded black troops together with their families emigrated from the West Indies to this colony. Seven years ago it was estimated that 20,000 liberated Africans had been sent to this territory. The popnlation in 1851 had, however, declined more than 3,000 in three years.

The colony (now Republic) of Liberia, founded in 1820 by the American Colonization Society, as the asylum of free negroes and liberated slaves, has not been a very successful experiment, considering the unusually favorable auspices, the material aid, and the continuous supply of emigrants which have been attendant on this humane attempt to inaugurate a civilized prosperous nation, in the land of their ancestors. At present it is represented that the Liberians are suffering from a severe famine. If the blacks of St. Domingo after half a century of independence have not retrograded, they have given no satisfactory proof of a steady progress in art, science, industry, civilization, or ability for self-government.

The British people whose sincerity in favor of negro emancipation did not consist in words only, but led them to tax themselves to the amount of one hundred millions of dollars in 1834, to free the slaves and compensate their masters, now see and acknowledge in less than a quarter of a century, that their once rich West Indian Islands are declining in commerce, population and civilization. A semi-barbarism, if not total extinction, is foreshadowed in the present condition of the black race in these garden spots of the world. From 1834 to 1849, the liberated negroes and the immigrant laborers from Africa as records show amounted to 32,877; nevertheless, the numerical decline in many parishes was, and still is, constant and considerable. How much soever the moral law requires barbarism, physical misery, or extinction, the physiologist and vital statistician cannot, in such results, discover any ground favorable to the ends whereunto he labors.

Waiving the ethical question altogether, the physiological induction to be drawn from these facts is, that the black barbarians of Africa present the most favorable, vital, industrial and moral conditions nowhere except in the southern States, under the control of masters, and that, as yet, history has furnished no example to show that these favorable conditions would be still more developed, or even maintained without retrograding, by bestowing freedom upon four millions of slaves. A possible result of emancipation in the southern States, in the West Indies, and the African colonizations, is that of a final relapse into barbarism without a constant counteracting influence from without, as at present.

As to the physical, mental, moral and political equality of mankind in the abstract, the physiologist has nothing to do; his vocation leads him to view man in his concrete or materialistic and phenomenal manifestations.

The world has wrangled from the first and will ever continue to do so, concerning the abstract, or doctrinal. The actual, especially if based on utility is, for the most part, the criterion to which opinion will and must succumb. "As one star differeth from another star in glory, so it is" in actual condition of men which is never that of equality, in physical or mental power. Nature has made them unequal, though this, in itself is no argument for or against slavery; nevertheless, in a practical point of view the superior rules the inferior, either by the right of might, or might of mind, the equity of which is a question for metaphysical disputants to decide in their closets or in debating societies. Sanitarians and physicians are concerned with that which *is*.

With the reader's permission, a few words will be added concerning southern Africa, from a great traveler: In the proceedings of the British Association, at Dublin, September, 1857, (for the report of which I am indebted to Dr. Egan, of New Orleans,) Dr. Livingstone gave an account of his travels and discoveries in South Africa, the principal item in which is a statement concerning the *negro medicine-men* and their power to regulate the rain. (The late sanitary commission of New Orleans professed to do more: namely, to regulate both rain and wind, as also to render yellow fever an impossibility whether it originate here or be imported).

Dr. Livingstone's account is worth repeating not only as illustrative of the aim of this paper, but for its exposition of the medical science and climate of Africa:

"He said: I wish to give you, from the map before me, a brief view of the geography of South Africa, which you may find useful at the meeting, to be held this evening. You see here (pointing to the map) the Cape of Good Hope, and this intended to represent the Table Mountain, with the table cloth upon it. When the south-east wind blows, a mass of air is lifted up suddenly about 8,000 feet above the level of the sea; as the mass ascends the column above it becomes less, the air expands, the dilation of the air causes vapor to appear, the top of the cloud lies on the top of the mountain, it curls over and meets air of the same temperature, and disappears. This phenomenon, which occurs on one mountain, also takes place along the whole eastern coast of Africa. There is an extended table mountain, as it were, all along the east coast, and the phenomenon occurs in a most extensive manner. You will observe that along the coast of Africa there is a range of mountains until you come to the river Zambese. The prevailing winds to these parts is the south-east. Those at the Cape are only occasional, hence the Cape people only see the phenomenon of the table cloth occasionally, but it occurs all along the eastern coast, and when the mass of air comes up to the top of the range of mountains and curls over, instead of meeting air of the same temperature—as at the Table Mountain—it comes over heated plains, and, of course, cannot give any moisture to those plains until the whole of the mountains are well saturated. I lived on the borders of the desert for some years, and had ample opportunity of observing the droughts. The people who live there believe that some persons have a power to make rain, and the mountain people are, many of them, called rain-makers. The people say: 'These men in the mountains have plenty of rain; they must have some charm, some knowledge of the medicine that cause the rain to descend constantly on their mountains.' It is a very difficult thing to convince them that they have no power whatever over the clouds. If you say to a rain-maker: 'Why these medicines have no power over the clouds,' they say: 'They have made rain for many years before you came here, and our women have become fat from the rain-making, which has caused plenty of rain to grow.' You reply: 'But I do not believe in your medicines;' they say: 'You do not believe in our medicines because you do not know them; God has given you, white people, a great many fine things which he has denied to us. He has given you clothing—we have none. You have wagons, and oxen, and guns, and gunpowder, and a great many good things, and he has sent you a book about which you are always talking. He has not given us these things. He loves you better than he loves us; but he has given us one little thing, and that is a knowledge of certain medicines by which we can make rain; and if you do not understand them you ought not to despise them, as we do not despise your wagons, and books, and guns.' You say: 'I do not believe, because they fail so often. You wait until the clouds come, and when you see it about to rain, then you take advantage of the fact and say you make rain.' They answer: 'You use medicines as well as we do. Sometimes, it is true, the rain does not come, but, sometimes you use medicines and the man dies; but you do not give up your medicines on that account.' These, and a number af other arguments, are known to all the people of the tribe, and the consequence is, that when you ask them not to trust in the rain-making, but to trust in God for rain, they say to you: 'Who would make a trial of starvation?' It is next to impossible to convince them. I have heard so many arguments in favor of rain-making, that I am almost a rain-maker (laughter). These arguments are not so very stupid either, and I must say that while in Africa I heard a good deal from home of people believing in spirit-rapping, table-turning, and other things just as wise as rain-making (laughter)."

The woolly-haired negroes of southern and western Africa, whence the 300,000 negroes were imported to North America, will, after a few more decennial periods, be inferior in numbers to their descendants in the southern States of this Republic. Col. C. H. Smith, an eminent anthropologist, who takes an unusually favorable view of the negro character, says, nevertheless, that "the typical woolly-haired races have never invented a reasoned theological system, discovered an alphabet, framed a grammatical language, nor made the least step in science or art. They have scarcely comprehended what they have learned; or retained a civilization taught them by contact with more refined nations. They have at no time formed great political states, nor commenced a self-evolving civilization. Conquest with them, has been confined to kindred tribes, and produced only slaughter. Even Christianity in Congo, has scarcely excited a progressive civilization. The worst slavery is his lot even at home, for he is there exposed to the continual peril of becoming also a victim, slaughtered with the most revolting torments. Tyrant of his blood, he traffics in slavery as it were merchandise; makes war purposely to capture neighbors; and sells even his own wives and children."—*Nat. Hist. of Man*, 196–7.

Hobbes, (born, 1588—died, 1679) an acute but not an infallible philosopher, admitted, long before the Declaration of Independence, "all men as being originally equal, having an equal right to all things, but as being taught by reason to sacrifice this right for the advantages of peace, and to submit to a common authority, which can preserve quiet only by being the sole depository of force, and must therefore be absolute, unlimited, and wielded by a single hand, by one man's will." In no civilized country does this equality or this absolutism exist in practice. Neither the Czar nor the Louisiana planter can find a better rule for state or plantation government than that announced more than a century ago by Buffier, who says: "I desire to be happy; but as I live with others, I cannot be happy without consulting their happiness." If Anaxarchus, who told Alexander the Great that his murder of Clitus was just, because every act of a ruler must be just, had resided in New Orleans, he might have seen two white men hung not long since, for murdering a poor slave-girl.

Mr. Carey's statistical account of the importation of slaves into the United States, reaches, in all, to 375,000 or 400,000; an estimate much higher than that of Mr. Gallatin and others. After deducting the number of slaves manumitted, absconded, and those sent to Liberia, and taking the period *subsequent to the prohibition of the slave-trade*, it will be found that the ratio of increase has not declined but augmented.

The increase in the decennium before the abolition of the slave-trade, 1790–1800, was 27 and a fraction per centum, while in the decennium *after* the trade ceased, 1810–1820, it was 29 and a fraction per centum; in 1820–1830, it was 30 and a fraction; in 1850, 28.81.' (See U. S. census). In the West Indies more than two millions are missing from the number originally imported.

The want of the physical elements of well-being, as food and so forth, has done much in depopulating Ireland. The Rev. Mr. Marshall stated at the last meeting of the British Association that the population of Ireland, as taken by the census of 1851, had declined 1,623,739, leaving but 6,555,385; of this number 2,766,283 could neither read nor write.

The difficult question relating to the real or apparent incompatibility of modern civilization with the vital statistics of certain races, has not formed any part of the present inquiry. *Why* the American Indians and some other races decline in the presence of civilization has not been explained; but its rejection, not its actual influence, must be the principal cause of this apparent failure. It has been proved experimentally, that the African barbarians in the condition of slavery, as the latter exists in the United States, can be civilized. In their native lands, they have, since the historic period, that is for thousands of years, made no advancement, mentally or morally.

M. Guizot maintains, in his history of civilization, that no fundamental principle, comprehended in this general term, is ever received by the world unless first sanctioned by France. But with more justice, it might be said that civilization, or rather its extension, in a general sense, is the result or accompaniment of war, conquest, colonization, commerce, navigation, and practical science. What nation soever possess these dynamical elements in the highest degree, must be the greatest civilizer, because the most progressive.

Modern civilization is indebted to Christianity for its noblest principles. The influence of these principles interests the physiologist and the vital statistician no less than the statesman. Without attempting to show the special bearings of its code individually, socially and vitally, it is sufficient to mention the benefits it has conferred upon woman, by elevating her from a comparative state of slavery or degrading subserviency, to equality with man, so far as her mental and physical constitution demands. The abolition of polygamy has contributed to the well-being of society and the increase of the species. In a word, scientific medicine finds in a high civilization its best ally and firmest security, and if they are not identical, they are inseparably united, mutual friends, dependent on the same state of society, having a common aim in the well-being of mankind.

Art. X.—*Medical Schools:* By J. C. Nott, M. D., Professor of Anatomy in the University of Louisiana.

Having been recently called to the professorship of Anatomy in the University of Louisiana, my mind has, necessarily, been attracted more closely to the snbject of medical education, and with the view of posting myself up fully in all the latest improvements for teaching anatomy, and of comparing the advantages and disadvantages of various points, I have occupied the past summer in visiting many of the more prominent schools in the United States.

The present number of this Jonrnal is about going to press in a few days, and although I have been but twenty-four hours in the city and have much else to occupy me in making arrangements for a change of residence, I have promised the editors that I will throw together hastily, the impressions which have been made on my mind, hoping at some future day to return to the subject more in detail.

It has been a prevailing idea, that the climate of New Orleans and other southern cities is an insuperable barrier to the full success of medical schools, and I confess that this prejudice has been very strongly rooted in my own mind. Though familiar with the fact that the history of medicine from the earliest epoch to the sixteenth century belongs almost exclusively to hot climates, yet the medical schools of temperate latitudes in our day, have so far ontstripped the ancient seats of learning, that I had began to think that the sceptre of science, as of political power, had passed into the hands of those northern peoples who have of late been governing the world.

When I tnrned my mind more closely to the subject, and analyzed the causes of the downfall of ancient schools, I soon found that there was something at work more baneful than *climate*, viz.: misrnle and indolence. Egypt was the most ancient seat of medical science, both before the conquest of the Greeks and during the existence of her famous Alexandrian school. If we follow the map around the Mediterranean Sea, we find that the march of medical science for ages was still exclusively through southern climes—Arabia, Greece, Rome, and in the middle ages, Italy, in succession held all of medical science known to the world. But the beastly Turk in Egypt, Arabia and Greece, and the despotic Austrian in classic Italy, have crushed out not only medical, but every other department of science and literature. If there are no Hippocrateses, Galens or Celsuses—no Homers or Virgils—it is not because genius is extinguished in these races, but it is because despotism has placed its foot on mind and body too.

The great difficulty, to my mind, against which southern schools had to contend, was the difficulty of pursuing dissections during our mild winters, for not only is the putrefaction of bodies disgusting and unwholsome, but it is inimical to the successful pursuit of minute dissection. For without the aid of antiseptics, a body will keep in Boston during the winter, a month, while in Charleston or New Orleans, there are times when you could not work on one for a week.

Anatomy is the ground work of the science and art of medicine, and other things being equal, the student should always seek that school where anatomy is best taught. It is vain to talk of learning physiology, pathology, surgery, obstetrics, or practice of physic without anatomy, and it is infinitely better to have no doctors at all than to have incompetent ones.

Those climates and those localities alone which afford the fullest anatomical advantages, can meet the requirements of the profession, and the student who is really conscientiously seeking to prepare himself for the arduous and responsible duties which await him, should keep his eye steadily on this point and not be gulled by newspaper puffs, circulars, and false promises. I repeat to the medical student, if you desire to effect anything useful or noble in our profession, go where you can learn thoroughly anatomy.

My doubts are now entirely removed with regard to the appropriateness of the climate of New Orleans for anatomical investigations, for we now have means by which we can preserve bodies perfectly in any weather, an indefinite period of time. I have just returned from Philadelphia, where I have received from my obliging friend Professor Leidy, much valuable information, and seen bodies preserved during mid-summer by means of antiseptics, as perfectly as they could be by the climate of Moscow or St. Petersburg. I dissected myself, in the private room of Professor Leidy, a body prepared under his direction, for two weeks, during the hot weather of September, and it was as sound and free from putrid odor the last day as it was the first—nay, more, the brain, nerves, and other soft tissues were rendered much more firm than natural and the rapidity and minuteness of dissection was much facilitated.

No city in the United States can at all compare with New Orleans in point of abundance of material for the anatomical student. We can command bodies for dissection to any extent at an expense far below any institution I am acquainted with, in fact, at the moderate cost of transportation of subjects to our rooms.

The facilities afforded for clinical instruction in the city of New Orleans are not equalled anywhere in the United States, and surpassed, if at all, by few places in the world. I am writing in haste and have not time to look up statistics of later date, but have beside me the "Report of the Board of Administrators of the Charity Hospital for 1850," in which the statement is made that the number of admissions into this institution for the years 1850–51 were respectively 18,476 and 18,420. There has been no change in the administration since that time, and the usefulness and interest of this great establishment has never flagged. The number of patients fluctuates from six or seven hundred up to fifteen hundred, and when we state that it is under the superintendence of such "ministering angels" as the *Sisters of Charity*, nothing need be added to illustrate the internal management of this charity.*

We have already stated that the early history of medicine, down to the middle ages, is to be sought exclusively among the people of warm climates; in fact, it is not until the seventeenth century that Germany, France and Great Britain began to take an active part in its cultivation.

Although we must gratefully acknowledge our indebtedness to Hippocrates, Galen, Celsus and other great names of antiquity, so great were the prejudices and difficulties which opposed the study of anatomy, that it was not till the sixteenth century that dissections of the human body were common, and it is to classic Italy, with a climate similar to ours, that we must turn not only for the revival of medicine, but for that solid advancement in anatomy which has laid the ground work of rational medicine. The schools of Padua, of Pisa, of Rome, and of Florence will long be pointed to as a bright galaxy in our history; and the names of Fallopius, Eustachius, Arantius, Cæsalpinus, Fabricius, Spigelius, Vasalius, of Scarpa, Morgagni, Mascagni, Valsalva, Malpighi, Spallanzani, and many other Italian names will stand out in honorable relief, as long as medical history is written and read. These laborers too have done their work in a climate not more favorable to anatomy than ours, and that without the immense advantages afforded us by modern chemistry in preserving bodies.

The museum of the University of Louisiana is unrivalled in this country. We need only state that besides numerous models from the best artists in France and England, we have duplicated the celebrated

* "The number of medical cases treated during the last year (1856) in the Hospital, was about 6,450; the surgical patients numbered 2,450; and the obstetrical cases, and those of special diseases of women and children about 500."—*Annual Circular, Medical Department, University La.*

collection of the Grand Duke of Tuscany at the Academy of Anatomy in Florence, which is unsurpassed—the latter collection alone gives more than 350 dissections, representing in detail the whole anatomy of the human system, together with many illustrative models of comparative anatomy.

But there is another view of the subject which should give great weight to the value of southern schools. The fact is well known that the diseases of warm and cold climates differ as much as do their fauna and flora. It has been said that a young man should not go to a medical school with the expectation of learning the practical details of his profession, but simply to ground himself well in those fundamental principles which are to guide him in after life; and that this kind of knowledge can only come with the routine of bedside experience. This is to some extent true, for in reality a medical student, after the ordinary routine of instruction, has learned little more than *how to learn;* but it is absurd to say, other things being equal, that there is not an advantage in a southern over a northern education, to those who are to practise in malarial districts. Those professors who have been for twenty or thirty years treating daily the diseases of the south, should certainly be more competent to instruct southern young men than teachers who have little or no experience with our diseases. I have never seen a lecture or essay from the pen of a northern lecturer on remittent or yellow fever that I could read half through, for I could see internal evidence at every step, that he was talking of things at secondhand, and about which he knew nothing. A northern lecturer would laugh at the idea of a New Orleans physician attempting to teach him anything about pneumonia, so different is the type of the disease in the two latitudes.

Still I would say to the medical student, go to that school where you can learn most anatomy, physiology and pathology, for these are the ground works without which a really enlightened and practical physician cannot be made, north or south, and it would be far better to annihilate the medical profession at once, than to fill the country with licensed quacks who are a curse instead of a blessing to society.

If, then, New Orleans possesses all the appliances for medical instruction in such extraordinary profusion, why, let me ask, can she not rear up a medical school, or schools equal to any in America? It is not my desire to make invidious comparisons, or to say unkind or ungenerous things of other schools. I should despise myself if I could be swayed by such feelings or such motives. The field of science is a Republic equally open to all; and with the population of the United States rapidly increasing, as it is, there will be room enough, and patronage enough for all those schools so located as to have the real substantial advantages necessary for medical instruction. All that should be asked by a school is "day light and fair play," and I for one shall always be ready to give the right hand of fellowship to those who pursue science, not for filthy lucre or false fame, but who, like men of honor, are willing to work in the cause of humanity, under the guidance of a fair, gentlemanly and scientific spirit.

New Orleans at this moment affords ample facilities for instructing 1000 medical students; facilities are increasing yearly; and so far from deprecating honest rivalry and emulation, I shall be glad to see it, for the great ends of science and humanity will by such means be the most surely attained.

Why, let me again ask, should not New Orleans become one of the leading seats of medical instruction in the United States? There is but one answer to this question—*all depends upon the medical teachers of New Orleans*—their energy, industry, and fidelity to the great trust reposed in them—if the schools fail it will be from the indolence, incompetence, and want of character of our teachers.

In this respect we may well learn useful lessons from some of our brethren of the North. I have spent a considerable portion of the past summer in Philadelphia, the field of my early professional studies, and I still feel a pride in my alma mater which has been the mother of medical science in America. I could not but admire the patient and enlightened industry with which this school, with its worthy rival (Jefferson School) have been laboring on from year to year in the good cause. May they long preserve the high position which they have so nobly earned, and remain as beacons to stimulate our exertions in the cause of science.

Art. XI.—*Cases of Sporadic Yellow Fever.*

New Orleans, September 29th, 1857.

Dear Sir—Having been informed that you intend to write an article on the yellow fever of 1857, I take the liberty to send you the notes of a case that came under my treatment.

Respectfully your obedient servant and grateful former student,

Doctor James Jones. F. B. ALBERS, M. D.

Joseph Linder, 22 years old, a Swiss; has resided in New Orleans four months; has been employed in an ice house all the time, situated near St. Mary's Market; he almost never left the house, and had not been near the shipping.

He was attacked with a chill followed by high fever, and pain in the back and head, on Monday night, July 13. He went to the house of a sister, No. 78 Julia street, where I first saw him on Wednesday, July 15th, having been sick for thirty-six hours. Cups had been freely applied to the back, head and epigastrium by his friends; the bowels had been opened by castor oil.

His face was flushed; skin very hot; pulse 120; tongue hot to the touch and loaded with a white fur; great thirst, and a little nausea.

Thursday, July 16th. Sleepless night; tongue red; face and eyes very red; skin intensely hot; very high fever.

Friday. Bleeding from the gums; the other symptoms about the same; late in the evening threw up a quantity of dark colored fluid, resembling a strong decoction of coffee.

He died very quietly a little before midnight.

The treatment was as the case indicated.

Autopsy eight hours after death, assisted by Drs. B. Dowler, A. C. Young, and J. P. Barbot.

The body yellow, particularly the extremities; muscles very rigid; stomach contained about six ounces of a dark fluid; liver of a florid yellow color; gall-bladder enormously distended, with a yellowish colored fluid; the bladder nearly full of urine; lungs collapsed and healthy; heart somewhat enlarged, its walls darker than usual, and contained a quantity of dark coagula.

CASES REPORTED BY MR. J. P. BARBOT.

Cases from Mr. Mehl's beer house, s. e. side of Girod street, near Tchoupitoulas street.

1st. Christian Miller; German; aged 26. Was in this city all last winter till June, working on the levee. In June, went to work on the Mobile and Ohio railroad. He went thence to work in a sawmill on the Mississippi river, and left it to come down here. Arrived here on the 12th of August last, and left again as deck hand on a steamboat for Napoleon, Arkansas. On the passage up was taken sick, which induced him to return. He arrived here for the last time on the 17th inst., and was taken at once, directly from the steamboat to the Charity Hospital, where he died on the 19th, with black vomit.

2d. William Adam Straser; German; aged 21 years. Resident two years in the United States.

Went last spring from Cincinnati to Franklin, La., where he remained all summer. He arrived in New Orleans from Franklin on the 12th of

September (inst.); was attacked on Friday, the 18th; taken to the Charity Hospital on the 20th, and died there on Tuesday, the 22d, at 7, A. M., having had black vomit.

3d. Albert Muëller, (joiner); German; aged 22 or 24 years; in the United States about four years; comes down here every winter to work and leaves again for the summer. Arrived here from St. Louis three weeks ago.

Was attacked on Monday the 21st., and taken to ward 13, Charity Hospital. (Was seen before being sent to the hospital by Drs. Wetzel and Henderson, as well as myself; considered by these gentlemen a case of yellow fever).

From Mr. A. Rose's, s. e. corner of Girod and Tchoupitoulas streets, next door to the above.

1st. Francisco Sabarle; Sicilian; aged 26 years. In New Orleans one year; oysterman, running in an oyster boat in the Gulf. Was attacked here on the 15th of September, taken to the Charity hospital on the 20th, and died there the same day. Black vomit was found in the stomach.

2d. Mateo Giacolome, Sicilian; aged 26; in the same room with the preceding; was attacked on Friday, 18th inst.; is now attended by Dr. E. C. Hyde; is likely to recover.

From Mr. Lyon's, shoemaker, s. e. side of Girod street, between Tchoupitoulas and Commerce streets, (next door to Mr. Mehl's.)

1st. James Carroll, Irish; aged 18; four years in the United States, and for the past year in New Orleans; has not left the city in that time. He died on Sunday, September 20th, in the fifth day of his illness.

This young man was not attended on by any physician; but on the day before his death was brought up to Dr. S. Woods', Apothecary, on Tchoupitoulas street near Julia, to be cured of what his friends called jaundice. Dr. Woods declined doing anything for him, alledging that he was too low.

Carroll died the next day, and Dr. Woods without making the proper inquiries, but satisfied with the friends' statements, delivered a certificate of "death by jaundice." He afterwards ascertained that the deceased had had no secretion of urine for four days before death, had had hæmorrhage from the gums and nose, and had vomited matter like coffee grounds.

This young man's sister, Ann Carroll, (from the same house) died in the Charity Hospital, on Friday, 11th of September, of what was diagnosed typhoid fever.

From Mr. Harding's grocery store, s. e. corner of Girod and Commerce streets

Mrs. Eliza Stanton, Irish; aged 44; has resided five years in St. Louis and for the last ten months in New Orleans; has not been out of this city in all that time.

She was attacked on Thursday, September 17th, and died on Wednesday, 23d, having had black vomit and hæmorrhage from the gums. Was attended in the last two or three days of her illness by Dr. Ford.

[These cases are deemed important in relation to the question of the domestic or imported origin of yellow fever, being among the first of the season. Dr. Albers' case which was witnessed by several physicians during the patient's life, and was confirmed by a postmortem examination, is supposed to have been the first case thus unequivocally established, excepting one which occurred in the practice of Dr. Mercier, a memorandum of which the Doctor has kindly furnished, as follows:

Dominique Maillot, Frenchman, aged 19 years, in New Orleans for the last two years, without leaving the city, living in 7th street, 4th District, between Constance and Annunciation; goes to the old French market, 2d District, every morning ; goes back home at 12 o'clock, M., every day; never went on board a ship nor near the shipping; very temperate habits; never was sick. Was taken ill on the 17th of June, 1857, presenting all the symptoms of yellow fever; was transferred to the Circus street Hospital on the 18th, and died on the 26th, at half-past 6 o'clock, A. M.

The progress of the case from first to last, with the exception of black vomit, was that of yellow fever. He had suppression of urine for thirty-eight hours before death.

Post-mortem examination the same day, at 2, P. M., eight hours after death. All of the abdominal organs were in a high state of congestion. The black vomit fluid was found in the œsophagus, stomach, duodenum and the upper part of the small intestine.

Dr. Mercier, desirous that the President of the Board of Health should examine the case both before and after death, sent invitations to that effect.

The Board of Health reported a fatal case in August.

It is hoped that the remaining space in the *N. O. Med. and Surg. Jour.* will permit the insertion of further mortuary details now in preparation by Dr. Chaillé. B. D.]

PROGRESS OF MEDICINE.

ART. I.—*Phthisis Pulmonalis.*

1.—*On the presence of elastic pulmonary fibres in the sputa of phthisical patients, as a certain sign of the existence of a vomica:* By J. L. C. SCHROEDER VAN DER KOLK, Professor in the University of Utrecht. Translated from the Dutch by WILLIAM D. MOORE, A.B., M.B., T.C.D., Honorary Member of the Sweedish Society of Physicians.*—Physicians have long felt the importance of discovering a certain sign by which the sputa of a phthisical patient might be distinguished from those coughed up in a chronic catarrhal inflammation of the lungs; and, as a copious formation of pus occurs in the former, the attention of observers has been chiefly directed to the acquirement of an adequate distinguishing mark between purulent sputa, and those containing only thickened mucus. It is well known that even Hippocrates† has stated that pus, when burned, emits a fœtid odor, and that it sinks in sea-water, while mucus does not.

This inquiry, not only as to whether it may be possible, in reference to sputa, to ascertain whether they consist solely of condensed mucus, or contain pus, but also whether we might be able in them to distinguish the matter of pulmonary tubercle, and so be in a position to decide on the existence of a vomica, and to recognize phthisis pulmonalis in its commencement, has given rise to very many different experiments and propositions, of which, unfortunately, not one has, as yet, led to any certain result.

Formerly it was attempted to discover the difference chiefly by chemical means; and it is well known that our Brugmans thought he had attained this object, inasmuch as he believed that pus was capable of undergoing acid fermentation, while mucus was not.‡ But the mistake was here committed of seeking a distinguishing mark between pure pus and pure mucus, and endeavoring to make this applicable to purulent mucus. Pure pus is, however, so easily discriminated from pure mucus by the eye alone, that in ordinary practice we need no chemical aid for this purpose; while, on the contrary, experience shows, that the several means of distinction are wholly useless, when applied for the purpose of

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* Several years have elapsed since I first became acquainted, through the medium of Herre Ekströmer's Sweedish translation, published in the *Hygiea* for January, 1850, with the valuable observations of Professor Schroeder van der Kolk, upon the above important subject. These observations have been briefly alluded to in the 22d volume of the *Dublin Quarterly Journal of Medical Science;* and very fully in the second volume of the present series of this Journal, in a review, by Dr. Banks, of Dr. Biermer's work, "Die Lehre vom Auswurf;" but considering it desirable that we should possess a translation *in extenso* of the memoir in question, in the absence of any information as to where the original was to be found, I applied to the distinguished author himself, and I am glad to avail myself of this opportunity of expressing my thanks to him for the kindness and readiness with which he at once sent me the last remaining copy of his essay, which, it appears, was originally published in the *Nederlandsch Lancet*, second series, first year, seventh part.—TRANSLATOR.

† *Coacæ prænot.* Ed. Linden, T. 1, p. 255.

‡ Brugmans, *Dissert de Puogenia*, p. 215. Gron. 1785.

diagnosing with certainty, pure thickened mucus from mucus in which pus is at the same time present, since, in the several degrees of admixture, the tests are not sufficiently accurate. I shall here mention only Grasmeijer's test,* which longest maintained its ground, namely—mixing pus with a solution of carbonate of potash, whereby it is converted into a gelatinous mass, while no such change is produced with mucus. Or Huenefeld's † proposal, to boil the sputa with sal ammoniac, by which they were said to be coagulated, if pus were present. Neither of these methods, however, affords a certain test. Equally little reliance can be placed on the fact advanced as a test by Gueterbock, ‡ that pus, in virtue of its fatty contents, burns with a flame, whereby, he says, we may distinguish purulent sputa from any others; for this character is by no means sufficiently well marked, and fat is also met with in thick bronchitic sputa. I have myself found the mucus on the inner surface of the finest ramifications of the bronchi, in an otherwise perfectly normal lung of an elderly woman who had died of hydrothorax, tolerably largely mixed with fat, although no trace of inflammation was perceptible in this case. Brett states that he has found acetic acid to be capable of coagulating mucus, but not pus. However, as mucus is always present in purulent sputa, this agent will not enable us to distinguish the latter. The subject will be found more fully treated of in the works of J. Vogel,‖ Gueterbock § and others.

Subsequently another method has been proposed, and it has been thought that the improvement of the microscope should furnish a means of distinguishing, with greater certainty, pus from mucus. This inquiry has given rise to a great number of essays on the form in which pus exhibits itself under the microscope, and on the difference between pus and mucus. Thus, after the discovery in pus of peculiar, more or less granular corpuscles, it was thought that through these the presence of pus could be accurately determined; and Vogel asserts, in his above-mentioned work, that we can, with the aid of the microscope, even in a mixture of pus and mucus, decide, of each smallest particle, though invisible to the naked eye, whether it is pus or mucus.¶ This writer, however, seems not to have observed that the same corpuscles occur also in inspissated mucus, and are not wholly absent even in healthy mucus from the mouth. Thus I have always found them, though in small quantity, in the saliva. They agree so closely with the corpuscles present in pus, that they cannot, indeed, be distinguished from the latter; though they may be somewhat more transparent—yet are they so like in form and size, that when mixed with pus corpuscles, it is impossible to distinguish them, and both, therefore, appear to belong to the same kind of formation. Simon** gives a tolerably good representation of them, taken from nasal mucus and thin bronchial mucus. Gluge ††

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* *Abhandl. v. Eiter*, etc., Gött. 1798, p. 59. † See Berzelius, *Thierchemie*, p. 599.

‡ Gueterbock, *De pure et granulatione.* Berol., 1837, p. 25.

‖ Vogel, *Ueber Eiter; Eiterung*, etc. Erlangen, 1838. pp. 96 et seq.

§ Loc. cit., p. 3 et seq. ¶ Loc. cit. p. 108.

** *Med. Chem.*, 1842. T. 2, st, 2, fig. 15 and 16, p. 310.

†† *Anat. micr. Unters.* II. 1. Mind. 1838, p. 26.

says that mucus-globules are always one-fourth larger than pus globules, and that they never exhibit any points (granulations?) I have often met them of the same size as pus corpuscles, and always found them granular. Henle * makes the same figure represent both pus and mucus corpuscles,† so that it does not in fact appear whence they are taken.

Buhlmann‡ also acknowledges that these mucus corpuscles render the idea of pus globules uncertain and doubtful. He considers them, however, to be exudation globules, arrested at a certain stage of their formation, and says that they occur not only in nasal and in bronchial catarrh, but also very plentifully in incipient tubercle.‖ These inflammatory globules are, however, usually larger, and exhibit a more granular appearance. Vogel gives a very good representation of them,§ and found them also in tuberculous matter taken from the lungs.¶ In inflammation I have often met them; they can very easily be distinguished from pus and mucus globules.

If we now put together the different modes in which pus globules have been described and delineated by different writers—of which Buhlmann** gives a good review in his above-mentioned work—that they occur also in a slight catarrh, and that even in chronic catarrh, the purest pus may be secreted, entirely agreeing with phthisical sputa,†† we shall be convinced that they cannot be with any certainty employed as a distinctive mark of suppuration, or of an incipient vomica; so that in my opinion they incorrectly bear the name of pus globules.

Other writers have, however, thought that in the sputa of phthisical patients, tubercular matter can be recognized under the microscope, and that thus a decision can be arrived at as to the existence of tubercular suppuration in the lungs, and the formation of an incipient vomica.

Vogel has represented as such, a granular mass which often occurs in the sputa of phthisical patients, and which he considers to be the product of tuberculous matter. This is found also in tubercles in dead bodies; and on this Vogel ‡‡ grounds his supposition. Buhlmann,‖‖ however, correctly observes, that this granular mass occurs also in chronic catarrh, and is therefore far from characteristic. It consists, according to him, of coagulated albumen globules, which have united into groups. Gluge §§ also describes the same, and says he has constantly met this granular mass, with compound inflammatory globules and pus corpuscles, in tubercular pus. In the same manner, Vogel,¶¶ in his late work, gives

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* *Allg. Anat.* p. 155, etc., tab. v. fig. 22.

† *Allg. Anat.*, p. 939, and explanation of the figures, p. 1025.

‡ *Beyträge zum Kenntniss der kranken Schleimhaut der Respirations organe*, Bern. 1843, p. 30.

‖ Loc. cit. p. 43.

§ J. Vogel, *Icones histologiæ pathology.* Lips. 1843, tab. iii, fig. 13 and 14, B.

¶ Loc. cit. tab. xv., fig. 3. c.

** Loc. cit. p. 19 et seq., tab. i. fig. 14, 18—20; Tab. ii, fig. 1—11, 20, 21; Tab. iii, fig. 1—6,

†† Buhlmann, loc. cit. p. 39.

‡‡ Vogel, *über Eiter*, etc., p. 112, fig. 10. ‖‖ Loc. cit. p. 59.

§§ *Anat. Microscop. Unters.* Heft. 1. Minden, 1838, p. 21, tab. xi., fig. 5. Heft. 2, p. 181.

¶¶ *Icones Histolog. path.*, tab. xv., fig. 111.

a representation of tubercular matter, taken from a tubercle. This consists, according to him, of smaller cells, larger inflammatory globules, and a granular mass.

As, however, these forms seem to occur as products of inflammation in sputa, where only chronic catarrh is present, they can be of no use in leading us to a conclusion as to the existence of tubercular matter.

Gruby* appears to have fallen into a much more serious error ; thus, he describes as characteristic of tubercular matter, globules said to occur in the sputa, with concentric spiral rings (sphæræ lenticulares,) which are nothing else than badly drawn starch granules from food which has remained between the teeth, or in the throat. Of the same nature are the expectorated pulmonary cells represented by him, which have nothing in common with the form of pulmonary cells, and by their regular rhomboidal shape at once betray themselves as vegetable cells: so that I am very much surprised that Buhlmann† has not recognized them as such, and that he has drawn them again. He says he has seen something of this kind, but that they must have been very much altered by the suppurative process; wherefore he expresses some doubt as to Gruby's beautiful figures. Gruby's sphæræ lenticulares he could not find; and he states that he is quite uncertain as to what Gruby has seen,‡ although Simon ‖ a year before, discovered that they were nothing but starch granules, which he said immediately turned blue by the addition of iodine. Dr. Gobée has, however, lately described them again at considerable length, and has given various drawings of them.§ He says he once saw them in the sputa of a peripneumonic patient, but took them for something accidental. In actual tuberculosis, he had never seen them. We may safely look upon them as starch granules, having nothing in common with the sputa of tubercle.

Gerber describes many kinds of tuberculous matter, as albuminous or unorganized, fibrous and hyaline tubercle, cellular tubercle, fibrocellular tubercle, and, finally, melanotic and organized tubercle. Buhlmann ¶ observes on this point, that in numerous examinations of tubercle, he found no other constant product than albuminous globules, or granules. The various kinds described by Gerber he could not find; neither have they occurred to me. Dr. Gobée says he has observed such organized tubercular matter in the sputa of a patient; and he represents oblong cells, which he thinks are elementary cells, in their transition to form fibres,** and actual fibres, having most conformity to recently developed connective fibres.†† If we examine an air tube and its bronchial ramifications in a healthy lung, we shall soon find that the oblong, boat-shaped, bottle, and thorn-shaped cells of Dr. Gobée are nothing else than more or less destroyed portions of the ciliated epithelium with

* *Gruby, Observ. Microscop.* Minden, 1840. See also Buhlmann, loc. cit., tab. i., fig. 10, 12, 15, 16.

† Buhlmann, l. c., p. 65, tab. i., fig. 17.

‡ Buhlmann, p. 59, et seq.

‖ Simon, *Med. Chemie.* Berlin, 1842. Bd. ii. Heft. 2, p. 316, note 2.

§ Dr. C. Gobée, *Tijdschrift voor wetenschappelijke Geneeskunde*, D. ii., st. ii., pp. 108, etc.

¶ Loc. cit. p. 60.

** Gobée, loc. cit. p. 113, fig. D.

†† Loc. cit. p. 114, fig. D.

which the air passages are lined even to their finer ramifications. Of the same natnrc appear to be his recently-formed fibrcs, differing completely from the fibres of which I shall hereafter speak. Dr. Gobée, however, thinks that out of the albuminous and fibrinous matter exuded in the lungs, his oblong cells are formed as elementary cells, which pass into actual connective tissue, whereby an obstruction, and through the new formation of connective tissue, an actnal enlargement of the pulmonary vesicles must take place, giving rise to asthmatic phenomena.* We can, however, in the present state of onr knowledge of the development of connective fibres, scarcely admit their new formation in the spnta.

I am also greatly surprised to see that Dr. Gobée states as a peculiarity, the formation, after the addition of acetic acid, of a great quantity of long, thick threads, which so increased on fnrther addition of the same re-agent, that the entire presented the appearance of a membranc composed of connective tissne. It is, however, a well-known fact, that mncus solidifies on the addition of acetic acid, and thus assumes under the microscope the form of thick transparent threads, and even membranes, which I have often also observed in nasal mucus, which have no referencc to thc formation of tubercle, and possess no peculiarity, except that they may easily mislead an incautious obscrver.

Lebert† gives, as a peculiar characteristic of tubercular matter, the presence of irregular oblong corpuscles of 0.05 millimetre, possessing no nuclei, as is shown by adding acetic acid, and which, together with many molecular granules, are agglutinated by a clearer matter. In order to see these well, the tnbercular corpuscles should be thinned with a little water, as otherwise they are too compact. They arc said to afford the most certain distinctive make of tubercular matter, as pus-corpnscles possess nnclei, and measure, on an average, ‡ 0.01 of a millimetre in diameter. When these tubercles soften, the tolerably solid matter which held the corpuscles agglutinated in the tubercles, begins to grow fluid; the tubercnlar bodies become free, enlarge, and assnme a more spherical shape.‖ If pus globules intervene, these come, according to him, not from the tubercular mass, but from the surronnding parts. The tubercular globules, however, rapidly dissolve, especially if they are mixed with pus;§ and this is, according to Lebert, the reason why they are scarcely ever met with in the sputa, in which, he confesses, he has never, with certainty, observed them.¶ Hencc, it follows, as a matter of conrse, that these corpuscles, at first described by Lebert as so characteristic, have no diagnostic value; and he himsclf also acknowledges that the microscopic examination of the products of expectoration in phthisis, can contribnte nothing to clear np the diagnosis, especially when the disease is still in the incipient stage.

From all this we see that neither chemical re-agents, nor the microscope, have furnished us with the means of distingnishing pus from mu-

* Gobée, l. c., p. 114, et seq.

† Lebert, *Physiologie pathologique.* Paris, 1845. T. l, p. 352, pl. viii., fig. 1, 2.

‡ Lebert, loc. cit., p. 356, 358.

‖ Lebert, loc. cit., pl. viii., fig. 4 and 5.

§ Lebert, l. c. p. 366.

¶ Ibid. p. 413.

cus in sputa, of recognizing the presence of pus in mucus, or of demonstrating that of tubercular matter.

Having been, however, for some time engaged in the examination of the sputa of phthisical patients, I discovered therein peculiar fibres, which, by their special course and characteristic form, I recognized as elastic fibres surrounding the air cells, and therefore appearing to me calculated, in the absence of any other distinguishing mark in the sputa, to afford a very characteristic sign of the existence of a vomica. Having thus had my attention directed to the point, I found them in all the sputa of phthisical patients which subsequently came under my observation, and, indeed, in the most opposite stages of the disease.—*See Ranking*, 70–5.

When we consult the observations of other writers on this subject, it is strange that the presence of these fibres has not attracted more attention. Investigators in general seem to have given themselves more trouble, though unsuccessfully, to look for certain distinctions between mucus, pus, and tubercular matter, than to examine closely the several forms and peculiar occurrence of these elastic fibres; and I am greatly surprised that, although the latter have been observed by some writers, no one has given an exact representation of them as they variously occur in the sputa. Simon appears to be one of the first to mention their presence in the sputa of phthisical patients; but he says no more on the subject than that he has seen more or less numerous fat globules, and some very fine tubes or fibres ramifying like vessels; while the representation he gives of these fibres is so incorrect, as rather to give rise to the suspicion that something had been accidentally mixed with the sputa observed by him, than that he had seen real elastic fibres of the lungs.* The plate given by Simon, of the tissue and vessels of the lungs, appears to represent nothing else than epithelial cells and fat.† Gluge,‡ to my surprise, says he never met fibres in tubercular matter. The drawings given by Vogel, in his excellent *Icones Physiol. Path.*, Tab. xv, xvi, and xvii, are important, where he represents these elastic fibres, as they occur in tubercles, taken partially undissolved from the lungs of a dead body, very well, but perhaps on rather too large a scale. He does not, however, represent them as they occur in the sputa, where their form and direction are often very different from what they are in the pulmonary cells. Thus in the sputa they are often broken up into smaller portions; yet they always retain their peculiar distinctive marks. Vogel ‖ observes that the occurrence of such dead pulmonary fibres in the sputa, is an equally certain and important sign that tubercular destruction of the pulmonary tissue has already set in. He does not, however, say whether their occurrence is constant, or whether they may also be absent in the sputa of phthisical patients.

Buhlmann, too, speaks of these fibres, and says that we meet them with areolar tissue in the sputa, especially in phthisis laryngea, or also in a vomica; that, however, they there occur more rarely, because they form the deepest layers of the abscess, which do not separate so early,

* Simon, *Med. Chem.*, T. ii., p. 316, fig. 18.
† l. c., p. 316, fig. 19.
‡ *Anat. microscop. Unters.*, Heft l. p. 21.
‖ *Icones*, p. 67.

and that we can find them much more easily by scraping with a scalpel after death. When, however, they occur in the sputa, they are the most certain sign of a suppurative process. But it is, he adds, self-evident, that we must often examine all parts very accurately, in order to find them; for, except in case of death of the lung, they occur extremely rarely. He says he has often found filaments of areolar tissue in syphilitic ulcers of the throat, and observes that we often meet them also in phthisical patients, especially when a tubercle has very rapidly softened and forms a spreading cavity.* He does not give a drawing of them. It is evident that he has confounded these elastic fibres with filaments of areolar tissue, which latter, however, appear to occur in the pulmonary cells in less number than the elastic fibres, and are easily distinguished from them, inasmuch as they become very transparent in acetic acid. The elastic fibres in the pulmonary cells, are, as we shall hereafter endeavor to show, separated from the cavity of the cells only by an extremely thin and weak membrane.

Lebert also speaks of these elastic fibres, and says that we sometimes, in the sputa of phthisical patients, meet very well marked pulmonary fibres; and that this is not unusually the case when there are cavities. That, consequently, their presence is an important aid in diagnosis; that they possess so peculiar a form that they can be confounded with no other fibres, particularly not with those of the trachea, which might occur therein; that as these pulmonary fibres can occur in the sputa only when the pulmonary tissue is ulcerated with tubercular matter, they afford an infallible sign of the existence of cavities (*cavernes*). He, however, also states that the elements of tuberculous sputa possess no specific character, and that it is only in some cases that the pulmonary fibres indicate the presence of tubercles; whence he infers that we are constrained to admit that the microscopic examination of the products of expectoration in phthisis contributes nothing to the elucidation of the diagnosis, especially when the case is one of incipient phthisis. But if the disease be confirmed, it is evident, he says, that the sputa lose their value in this respect, inasmuch as other physical and rational signs then exist, which enable us to establish the diagnosis.† He does not delineate these fibres as they occur in the sputa; but he gives a drawing of them as they are met with in a tubercle taken out of the lungs,‡ which drawing is, however, less characteristic than that given by Vogel.

Rainey,‖ in his recently published beautiful essay on the minute structure of the pulmonary cells, and the formation of tubercle, makes no mention of the elastic fibres in sputa. He merely says that the expectoration is in great part derived from the mucous membrane of the bronchial ramifications, and very probably cannot be distinguished from that in an ordinary case of bronchitis; but he believes that when the tuberculous matter is dissolved and expectorated, it can be with certainty recognized by no other sign than the debris of the membrane internally investing the cells.

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* Buhlmann, l. c., p. 64 et seq. † Lebert. l. c. T. l, p. 413. ‡ Ibid, l. c., pl. viii, fig. 11, B.

‖ G. Rainey, on the Minute Structure of the Lungs, and on the formation of Pulmonary Tubercle, in *Medico-Chirurgical Transactions.* London, 1845, vol. xxviii, p. 595.

From the foregoing it appears, that of all the signs in phthisical sputa of the existence of a vomica, none remains except the presence of elastic fibres when these appear. The question therefore, is, do these occur with sufficient regularity to serve as a certain indication of the existence of a vomica?

That they are by no means of such rare occurrence as several writers state, I have convinced myself from my own observations, inasmuch as after I had once discovered them, I have never missed them in any sputa of a phthisical patient, and I have constantly found them in greater or less quantity. The question is, therefore, do these fibres occur only when phthisis is already far advanced, and has produced great destruction; or are they present in the sputa from the first formation of the vomica, so as to indicate with certainty the existence of a vomica from its very commencement?

On this important subject I believe I may express my conviction, that, as I shall endeavor to show, these elastic fibres exhibit themselves in the greatest quantity precisely in the beginning of phthisis, and in the first formation of a vomica, and that they belong to the most certain signs we possess of the presence of a vomica. Subsequently, when the vomica has increased to a considerable cavity, they usually occur more sparingly and less distinctly in the sputa, and this appears to me to be one of the principal reasons why many writers have either not observed these fibres, or have taken but little notice of their presence.

This struck me particularly in the case of a young man of phthisical disposition, who had for more than a year suffered from a severe catarrh, and to whom I was this summer called in consultation. On the first examination I made, I was soon convinced of the existence of an inflammatory process in the lungs; the pulse was usually above 100 in the minute; the cough was very severe; the sputa were more or less red colored and globular, though for the most part floating; bodily exercise, as well as continued speaking, excited the cough; night sweats began to increase from time to time, and on any great excitement the peculiar flush appeared upon the cheeks. Occasionally he complained of some pain in the right side between the seventh and eighth ribs. On as accurate as possible, and repeated examination, the ordinary respiratory murmur was distinctly heard in both lungs; percussion yielded a particularly dull sound nowhere except pretty low between the seventh and eighth ribs on the right side. On the application, however, of leeches, and of an issue to the affected part, these inflammatory phenomena, probably the consequence of a slight pleuritic affection in that situation, with a severe bronchitis in the finer pulmonary ramifications, disappeared; the dulness on percussion in the part became less, and after a repetition of the leeches altogether ceased; deep respiration became entirely free; and under the use of cod-liver oil, with pills containing extract of lactuca virosa, the phenomena began so far to improve that the nightly perspirations were completely checked, the cough diminished, and the pulse finally returned to about 80. The expectoration of globular and occasionally red colored sputa, however, continued, though in diminished quantity. After a couple of months the cough began to be more violent, in consequence of renewed colds and an attack of catarrh;

the sputa again acquired a less favorable aspect, and in great part sank in water, and the pulse once more became quicker. The examination of the chest now showed that between the second and third ribs of the right side, the sound on percussion was somewhat duller; no pectoriloquy could, however, be discovered; mucous râle alone was heard, and that with difficulty. Leeches were now again applied, and the issue was moved from below up to the more affected part. Now, for the first time, examining the sputa under the microscope, I found the pulmonary fibres above described in tolerably large quantity, which still further convinced me of the danger the patient was in; however, under the treatment, all the phenomena again diminished, the pulse sank once more to 80, the cough became easier, and the inflammatory symptoms decreased. But as the sputa continued pretty copious, I gave twice a day, in addition to the other remedies, and the occasional daily use of flax-seed tea, lime-water and milk; this the patient bore very well, and soon after the quantity of expectoration began remarkably to diminish, the nightly perspiration entirely ceased, the cough lessened, deep inspiration was unattended with inconvenience, and exercise produced less violent coughing. I requested a friend, a very experienced auscultator at ———, to examine the patient accurately, during a short stay there, particularly as he had seen him a year before, and had then found his chest to be in a perfectly normal condition. I shortly after, in the beginning of December, 1845, received the following answer: "In consequence of your request that I should communicate to you the results of my examination of the patient, I have examined him during his stay here. My first and principal object was to ascertain for you the phenomena observable on percussion and auscultation. Both sides of the chest appeared to me to be equal in form and circumference; percussion on the left side presented no abnormity; the right side was not so easily examined by percussion (on account of the issue). I have, however, so far as was possible, without putting the patient to pain, percussed the entire of the thorax, including the seat of the issue. Though I paid the greatest possible attention I could not discover any dulness; I can at least positively assert, that the sound in the supra-clavicular region was normal. Whether a dull sound should have been heard if the seat of the issue had been struck harder, I cannot decide. On auscultation, the respiratory murmur was normal, both anteriorly and posteriorly. On neither side of the chest could anything pathological be discovered posteriorly, while the respiration was suspended. The heart's impulse was not transmitted farther or with more force through the pulmonary tissue, than is the case in healthy individuals. At the seat of the issue I immediately found the râle described by you. The sound was unmistakeable, and was circumscribed in a small space as a mucous râle. I need not say that I did not confine my examination to what I have here communicated, but I wish, in one word, to add, that the form, color, and quantity of the sputa appeared to me only too decidedly to confirm the suspicion of the destruction of a portion of the lung.

"On the principal point, therefore, my examination gives no other result than yours. This result is in itself, certainly not particularly satisfactory, as it affords every reason for assuming the presence of tubercular softening." (I had informed my friend of the existence of elastic fibres in the sputa). "If we, however, take into account the degree and extent of the local affection, the slight disturbance of the physiological function of the organ, and the favorable condition of the general system; if we, at the same time, recollect the slow progress of the disease, which probably now dates from a year and a half back; if we add to this, that some general phenomena had, in the space of time that he was under my care (above half a year—he had previously used no remedies of any importance,) even taken a turn for the better, the prognosis will perhaps be somewhat more favorable. I recollect your expression on this point in your former letter, that tubercular softenings, as small vomicæ, heal more frequently than is usually supposed." Thus we not unfrequently find in the lungs cicatrices of small vomicæ which had previously existed.

Hence, therefore, it appears certain that phthisis had in this case as yet made no great progress; all the phenomena of the disease were wanting except the cough and the presence of elastic fibres in the sputa, and according to a report communicated to me some days previously by the same physician, the patient was in better condition and stronger than he had been a year before, although he still was thin. The so-called physical signs of phthisis, the results of percussion and auscultation, yielded nothing certain, and the mucous ronchus, although an unfavorable sign, is surely no proof of the existence of a vomica, as it is also often present in bronchitis when the bronchi are in any degree filled with mucus; nevertheless, exactly at this time, the quantity of elastic fibres visible in the sputa was so excessively great, so that they spread continuously over the entire field of vision of the microscope. Since this time, under the continued use of the same remedies, the cough has very much lessened, the sputa have diminished in quantity, and the elastic fibres begin to be fewer in number, so that, in fact, the prognosis is now more favorable, particularly since the issue has been applied upon the affected part, and the use of lime-water was commenced. It, however, appears that where the physical signs yield uncertain results, and do not decidedly indicate the existence of a vomica, the presence of these pulmonary fibres in the sputa plainly prove that the process is not as yet wholly arrested, and that the wasting of the pulmonary tissue progresses, so that we might hence infer that this sign is really more certain than those afforded by auscultation and percussion, and that it is eminently worthy of the attention of physicians.

This will become still plainer if we add to the foregoing a remarkable case given by Buhlmann,* of a patient in whom the sputa were exactly like those of a phthisical person, and were very copious, so much so, that he brought up, with the greatest ease, whole spoonfuls of perfectly purulent fluid, just as if a considerable vomica had existed; at the same time, pectoriloquy, cavernous respiration, etc., were heard in the dilated bronchi; the microscope exhibited the most perfect and unmistakeable pus, and no doubt was entertained of the presence of a vomica, while

*l. c., p. 39.

dissection proved that no abnormity existed but dilatation of the bronchi, without either vomica or ulceration of the mucous membrane, consequently no elastic fibres could be found in this case.—*Dublin Hosp. Gaz., Sept.* 1857.

2.—*On the proximate cause and specific remedy of tuberculosis:* Abstract of a paper laid before the Academy of Medicine of Paris, on the 21st of July, 1857: By John Francis Churchill, M. D.—The total number of cases of phthisis treated by me amounts to thirty-five. All were in either the second or third stages of the complaint—that is, they had either softened tubercles or cavities in the lungs. Of these nine recovered completely, the physical signs of the disease disappearing altogether in eight out of that number; eleven improved considerably, and fourteen died; one still remains under treatment.

I believe that the results, of which the preceding is a summary, taken in connection with the considerations I have set forth at length in the paper now in the hands of your Hon. Secretary, will be found to justify the following conclusions:

The proximate cause, or at all events an essential condition of the tubercular diathesis, is the decrease in the system of the phosphorus which it contains in an oxygenizable state.

The specific remedy of the disease consists in the use of a preparation of phosphorus, uniting the two conditions of being in such a state that it may be directly assimilated, and at the same time at the lowest possible degree of oxydation.

The hypophosphites of soda and lime are the combinations which hitherto seem best to fulfil these two requisites. They may be given in doses varying from ten grains to one drachm in the twenty-four hours. The highest dose which I have been in the habit of giving to adults is twenty grains.

The effect of these salts upon the tubercular diathesis is immediate, all the general symptoms of the disease disappearing with a rapidity which is really marvelous.

If the pathological deposit produced by the dyscrasy is of recent formation, if softening has only just set in and does not proceed too rapidly, the tubercles are absorbed and disappear; when the deposit has existed for a certain time, when the softening has attained a certain degree, it sometimes continues in spite of the treatment, and the issue of the disease then depends upon the anatomical condition of the local lesion, on its extent, and upon the existence or non-existence of complications. I have made numerous attemps to modify the local condition of the lungs by the inhalation of different substances, but have never obtained any satisfactory result independent of what was to be attributed to the specific treatment. The hypophosphites of soda and lime are certain prophylactics against tubercular disease.

The physiological effects which I have observed to be produced by the use of the hypophosphites of soda, lime, potash and ammonia, show these preparations to have a two-fold action. On the one hand they increase the principle, whatever that may be, which constitutes nervous force; and on the other, they are the most powerful of hæmatogens, being infinitely superior to all medicines of that class hitherto known.

They seem to possess in the highest degree all the therapeutical properties formerly attributed by different observers to phosphorus itself, without any of the danger which attends the use of that substance, and which has caused it to be almost forgotten as a medical agent. The different preparations of hypophosphorous acid will undoubtedly occupy one of the most important places in the materia medica.

The Academy resolved that the paper be referred to a committee, consisting of MM. Louis, Trousseau, and Bouillaud.—*Dublin Hosp. Gaz.*, *Aug.* 15, 1857.

3.—*Of the nature of phthisis, and particularly of the pre-tubercular stage:* By Dr. E. SMITH. (*Lancet*, Nov. 1, 1855.)—After pointing out the advantages of special hospitals in the study of diseases, the object of the author is to show—1st, That the treatment of phthisis, in order to be commonly successful, must be in the pre-tubercular stage; 2d, That there is a pre-tubercular stage, which is capable of easy demonstration, and in which treatment would commonly prevent the deposition of tubercle; and 3d, That the nature of phthisis essentially consists in a lessened inspiratory action of the air-cells of the lung. He admits that phthisis is induced by a multitude of causes, but he affirms that the tendency of all these is towards exhaustion, and that they, although many, have one common mode of action in inducing the disease. He criticises minutely the prevalent opinion, that phthisis is a disease of the blood, and proves that whatever may be the state of the blood in the disease, there is no universal condition of it which attends the origin of the disease, or which is really causative of it. The state of the system, which is one of the causes of phthisis, is one of both solids and fluids, and is to be expressed rather by a general predisposition to the disease than by the specific state of the part of the system—viz.: the blood, in which the elements of the disease had never been found, or had been directly transmitted to another system. He also proves from his own investigation, that the function of alimentation was not at fault as causative of phthisis, by showing that the quantity of food taken in the early stage is equal to that in health; and by reference to the fæces, solids in the urine, biliary and cuticular excretions, he showed that there was then no larger excretory waste than occurs in health. The lessened action of the air-cells he proved from the lessened vital capacity, feeble respiratory power, and lessened mobility in the early stage of the disease, the consequently lessened vesicular murmur, increased harshness of respiration and flattening of the chest, with or without slight dulness, indicative of atrophy of the lung. He also proved that the signs of lessened vesicular action are found in all those cases, which, by common consent, are said to be prone to phthisis, and mentions instances in his own practice at the hospital, in which the vital capacity was reduced to the extent of two-thirds, or half of the healthy quantity, without there being any evidence of the deposit of solid matter in the lung. This stage of lessened vesicular inspiratory action, without any evidence of tubercular deposition, he designated as the first stage of the disease, one in which every hope of success may be entertained from suitable treatment. The second stage was that of tubercular deposition, and the third, that of destruction of tissue, whether to the extent of softening only, or to the further degree of the formation of a cavity. He then proceeds to show the connection between the act of inspiration and the circulation through the lungs, and the importance of maintaining a balance between the systematic and pulmonic circulations, and explains the especial liability of the apex of the lung to tubercle, by a consideration of the mode of action of the lung, whereby the cells at the apex must at all times be less perfectly distended than those at the base, and, consequently, have less circulation and vital influence. He discards the notion of the deposition of tubercle in the lung from the blood, and having referred to Dr. W. Addison's theory of the formation of tubercle on the lung from degenerated epithelium, shows how readily the air-cell is rendered fit to be a receptacle of such morbid products when its action and vital influence are lessened or lost. The extreme liability of the lungs to the deposition was not from any question relating to the blood, but from a consideration of the peculiar action of extrusion and retraction of the air-cell (as he had demonstrated,) and from the immense number of such filled receptacles as the air-cells of the lungs offered. He believes that phthisis and scrofula are distinct diseases, and that whilst they may be sometimes causative of each other, their co-ordinate occurrence was chiefly accidental. Dr. Smith also explains the occurrence of hæmoptysis before the deposition of tubercle, upon the principles now laid down, and points out the impropriety of any attempt to arrest it directly, and also of interfering with that degree of increased frequency of respiration and pulsation which nature sets up as a prophylactic measure when the amount of circulation in the lungs is so greatly lessened as it is in all stages of phthisis.

4.—*On the treatment for the arrest of phthisis:* By Dr. Edw. Smith. Assistant Physician to the Hospital for Consumption at Brompton, (*British Med. Journal*, Jan. 10, and Feb. 7, 1857.)—After having investigated the subject in a very careful manner, Dr. Smith has arrived at the conclusion that alimentation is *not* at fault, since the quantity of food taken is equal to that in health, since digestion is good, and the waste of material not greater than in health, and that the respiration is at fault. The theory propounded is that the disease essentially consists in the lessened action of the air-vesicles, and that it is commonly due to anterior conditions of the general system of a depressing nature. These general conditions are in part, probably, certain atonic states of the nerves of organic life, and more particularly of the sets of those nerves and of the communicating branches of the cerebro-spinal system which preside over the involuntary and also the voluntary action of the lungs.

The treatment recommended may be summed up in the following sentence: Forced inspirations, out-of-door exercise, good and frequent food, sleep, early rising and retiring to rest, cool, moist air, cold washing, moderate excitement of the mind, and medicinal tonics. There is also another, which may rather be considered a prophylactic of phthisis, and which, in his opinion, is of far greater value than the community at the present day admit; viz.: athletic exercises, and country sports and games.

The means upon which Dr. Smith lays most stress is that of "mechanical distension of the air-cells to a degree beyond that which takes place perhaps in health, but certainly in the state of enfeebled respiration in which we find the patient. This may be effected by bodily exertion, which tends directly to increase the frequency and the depth of inspiration; and, as this mode is so consonant with our knowledge of the laws whereby health is maintained, no objection will be urged to it. But to my mind there is the objection that, in phthisis, whether before the manifest deposition of tubercle, or afterwards in the early stages of the disease, the pulse is frequent proportionately to the respiration; so that the respiration is to the pulse, not as 1 to 4, but as 1 to 5, 6, or 8. I have paid much attention to this matter in a long inquiry which I have prosecuted at this hospital, and am assured that, in the early stage of phthisis, the proportion of the two functions is commonly reduced. Now the pulsation is at least frequent enough, and it is not uncommonly too frequent; and hence we do not need to apply any remedies which may increase the rapidity of the blood-current. But exercise of body, and even the sitting and standing postures, do increase the blood-motion; and, although they at the same time increase the rapidity of breathing, they do it in a less ratio than the former. Whilst, therefore, bodily exertion may be useful, and is indeed necessary in giving more rapidity and depth to the inspiratory effort, it is not an unmixed good. But we must not forget that the quiet motion of the body, which is now said to be bodily exercise, does not excite the depth of inspiration sufficient for our purpose; and it is only when it becomes so great as is needful in athletic exercises that the desired result is attained. Hence the directions which we commonly give are of little avail, although the tendency of them is right. Yet, with the violent bodily exertion referred to, the rapidity of the blood-current is greatly increased, and at the same time there is a proportionate diminution in the deposition of material in the tissues, and in the due action of the air upon the blood in the lungs. Thus lessened growth of body occurs, with, at the same time, less vigor of vital processes, and a waste of material through the eliminating organs. This must result when the body is in health; but then the temporary evil is either easily borne, or is compensated by good; but when, in phthisis, at least in the tubercular stages, we find a tendency to a constant rapidity of current, and consequently to lessened growth of tissues, we must attach a greater degree of importance to it. The effect of much exercise in phthisis is, therefore, evil certainly, although, at the same time, it may be, but less certainly, good.

Now, is it possible to meet this difficulty, and to find a mode whereby the depth of the inspiratory act shall be increased, and yet the rapidity of the blood-current not sensibly promoted? Perhaps not, in the fullest sense of the inquiry; but I think it may in a limited yet important sense. I refer to voluntary attempts at deep inspiration. This cannot be continually effected, since volition cannot be at all times directed to that end; and if it could, the very act would fatigue the system; but it may be for a limited period at a time: and the very instruction thus given, if properly explained, will induce the patient to guard against that shallow respiration which is so constant a feature of the complaint. Thus the mind would be directed to an object of value; the spirits would be excited by hope; and the evils attending a listless and enfeebled habit of respiration would be in some degree guarded against. This object is doubtless attempted when the patient is directed to use calisthenic exercises, as the use of the dumb-bells; and there can not be a doubt that the vigorous employment of such means may excite inspiration. But it is one thing to throw the arms about, and another to make that conducive to the deep inspiration. We must admit that, whilst the object is good, the practice has commonly defeated the object, and that perhaps in a great degree from the want of knowledge on the part of the patient to enable him to make his efforts efficient. Moreover, I am not clear but that sometimes, and, perhaps, frequently, the effort now referred to, lessens the frequency, and without increasing the depth, of inspiration; for nothing is more common than for us to hold our breath when making any unusual voluntary exertion.

I think that nothing less than direct voluntary attempts to breathe deeply would effect the object we have in view; and even this is certain to fail unless it be carefully effected. The seat of mischief is chiefly in the upper lobe and the apex of that lobe. Now, if we take an ordinary inspiration, we find that the expansion of the chest is disproportionally greater in the lower than in the upper half of the chest; and when the respiration is unusually feeble, this disproportion is so much the greater that scarcely any breath-motion may be detected under the clavicles. But, on deep inspiration, the first sensation of fulness is at the base of the lungs, and that sensation gradually rises as the depth of the effort increases, until, at the very end of the deepest inspiration, the sensation is felt at the apex. This may be readily proved by any one who will take the trouble to try it carefully upon himself. Now, in this very fact lies the difficulty of the matter. It is almost impossible to persuade a phthisical patient to take an inspiration of the depth referred to; for his habitual shallowness of effort induces him to consider *that* a deep inspiration in which the lung is by no means fully distended. It is my habit to show the mode and the required depth by my own inspiration, and to inform them that it is only the *very end* of the deep inspiration which is of service to them. Our aim should therefore be to have the deepest inspiration performed as often as we think right, with a view of thus preventing the process of closure, which is, in my belief, the mode of action of the disease. If there were not a serious objection to the introduction of any instrument as a part of medical treatment, I should advise the employment of a spirometer, which would measure the amount of air inspired; and this, whilst engaging the patient's attention, would enable him to regulate his voluntary efforts, and to ascertain the result. I have several in use; and, after a repeated employment of them in determining the amount of vital capacity at various periods, the patients have expressed much gratification in the assurance that they felt much better from this forcible attempt to inspire deeply.

I fear that this may be thought too mechanical a plan of treatment; but I beg to observe, that the very existence of the air-cells themselves is in part due to the mechanical introduction of air within them. There are no developed air-cells in uterine existence; and even during the first early period of extra-uterine life they are so slightly developed as to be said not to exist at all. When the air is first admitted into the bronchi, there are no true cells such as may be found in later life; and the period of their development is that of breathing, and their maturity is due to the continuance of the effort. Thus the development of the air-cells may be said to be due to the mechanical agency of inspiration. Moreover, we know how greatly the depth of inspiration is due to volition, to the thousand necessary occurrences of daily life, and to the effect of other diseases; and we admit at once that the effort of inspiration varies under these several conditions. Hence it is not unphysiological to direct an effort to make the act of inspiration perfect (as we daily do to render the digestion of food perfect), and to keep in a due state of distension, or to increase the existing degree of distension, of the air-cells of the lung.

I do not know if any difficulty would present itself to any mind in reference to the limitation of the lessened action, or of collapse to isolated small portions of the lungs, as is believed to exist on this theory. Perhaps it is more easy to understand how the whole organ may be influenced, rather than a part of it; but, in addition to the special disposition which must exist in the upper lobe, and especially of the apex, from the direction and depth of the air-current in inspiration, I may refer to the fact that the atelectasis of the newly born is always partial, and may be even limited to one or to several isolated and separated lobules. Hence it may be said to act only on individual cells, and is a fair illustration of that which is believed to exist in the earliest stage of phthisis. The one is not more difficult of belief than the other.

To show that voluntary inspiration not only may, but has been defended on physiological grounds I would refer to a remark made by Lehmann, vol. iii, p. 382. In reference to excretion of carbonic acid largely, he says: 'We may perhaps aid a tuberculous patient quite as much by recommending him to respire warm moist air, as if we prescribed lichen or cod-liver oil. Instead of tormenting an emphysematous patient suffering from congestion, and of hemorrhoidal tendencies, with aperients and saline mineral waters, we might relieve him far more effectually by recommeding him to practise artificial augmentation or expansion of the chest in respiration (filling the lungs several times in the course of an hour,) or to take exercise suited to produce this result; while we should forbid the use of spirituous drinks, and not prescribe tinctures, which might hinder the necessary excretion of carbonic acid.'

In advising this course, I do not for a moment refer to any increased chemical influence which the increased volume of air may or may not have upon the blood, neither do I make use of the theory that, by this means, we effect pressure upon tubercle, and promote its absorption; I only claim for it, that it will tend to prevent the decay and the closure of the cells from inaction, and thus prevent the further deposition of tubercle in cells which are not already rendered useless by or with it. But it is fair to infer that there must be by this means a more complete renewal of the residual air, and thereby a further benefit be obtained. It may, however, be proper for me to refer to the experiments of Vierordt in reference to the influence of voluntary respiration in promoting the evolution of carbonic acid. He ascertained that the more frequent the respiration, the less percentage of carbonic acid was evolved; but, as the total quantity of air taken into the lungs was increased by an increased number of inspirations of a uniform depth, the total quantity of carbonic acid evolved in a given time was greater than with fewer inspirations. Thus:

With 12 inspirations	per minute	$13\frac{1}{2}$	cubic inches	were evolved.
" 24	"	"	24.2	"	"
" 48	"	"	42.5	"	"

And in reference to variation of depth, the frequency being constant, he proved that, with an inspiration twice as deep, the quantity of gas evolved was the same as when the inspirations were three times as frequent, the depth then being constant. Thus the objection which is so commonly raised to voluntary attempts to respire, viz.: that it does not increase the vital force, is incorrect; for, in practice, we are not concerned with the percentage evolution of carbonic acid, but with the total evolution in a given period.

The reason for the large increase in the amount evolved by an inspiration simply twice as deep as an ordinary one, is, that the air in the air-cells is richer in carbonic acid than that in the minute bronchial tubes, in the proportion of 5 to 3; and hence, as a deeper inspiration causes more movement in and exchange of the residual air, the air-cells must lose a larger quantity of the products of respiration. Hence the remedial influence of deep voluntary inspiration is both mechanical and chemical.

The effort now recommended may weary the patient; and hence I have thought it enough if the patient thus deeply, slowly, and gently respire for five minutes at a time, and on three or four occasions in the day, at the same time explaining the object, and recommending him to avoid shallow breathing in his ordinary respiration. Thus fatigue is avoided, and yet, probably, the effect is obtained.

It is, however, essential to the success of this plan, that it should be fairly carried out: and if, from other causes, no success results, I do not know of any mischief which could possibly arise from this. Success will, of course, be dependent upon many causes, and hence neither this nor any other single plan of treatment can be exclusively relied upon. It has, however, this merit, that it is of almost universal application, has evidently a tendency to improve the health, and cannot do harm. When there is no tubercle deposited, I am of opinion that the plan, if fairly carried out, can hardly be inefficacious; but, in the last stage of phthisis, the possibility of arresting the disease by any means is very small.

5.—*On the diagnostic value of the symptoms indicative of Pulmonary Cavities:* By Dr. N. Friedreich. (*Verhadnl. der Phys. Méd. G. in Würzberg*, Seib. Bd., 1856; and *Med Chir. Rev.*, April, 1857.)—The cracked-pot sound, the tympanitic percussion sound, the amphoric and metallic respiratory sounds, are in this paper examined in relation to the diagnosis of pulmonary cavities. We recently drew attention to

Professor Bennett's observations on the occurrence of the cracked-pot sound in various conditions unconnected with cavities. Dr. Cockle has also shown that it may occur in cases of simple bronchitis. Dr. Friedreich gives three cases of pleurisy in which this sonnd was met with. In the first (a man, aged twenty-two), it occurred in the left infra-clavicular region, at the time when the effusion on the same side was receding, and it lasted until its complete absorption. In the second (a man, aged twenty-two), the sonnd occurred from the commencement of the affection, and whether the nose and mouth were open or closed, in the left infra-clavicular space, as far as the third rib, to which the pleuritic effusion reached. It disappeared before any change in the exudation was perceived. In the third case (a man, aged twenty-three), the *bruit de pot-fêlé* was produced, the mouth and nose being open, at the upper left side, down to the third rib, at which point the effusion commenced. The patient was still under observation when the paper was written. With regard to the occurrence of the sound in healthy snbjects, Dr. Friedreich has failed to discover it in the adult, but on examining forty-six children under fourteen years of age, he met with it twenty-six times—fourteen times audible on both sides anteriorly, but only in five equally loud—in the other cases, generally louder on the left than the right side, and only twice louder on the right than the left. In explaining the production of the cracked-pot sound, Dr. Friedreich opposes the theory that it is due to air being forcibly expelled through the glottis; because, on applying the stethoscope to the larynx, while another person produces the sound, no indication of its formation at the glottis is obtained. In bronchitis and early infancy, he believes the production of the sound to be due to the compression of the smaller bronchi during the act of percussion. He adopts Skoda's theory of its prodnction in phthisis, while in pleurisy, he attributes it to compression of the pulmonary tissue by the exudation, and the forcible expulsion through the smaller bronchi of the air contained in them, when percussion is employed.

6.—*A case of peri-tracheal deposit with secondary disease of the Lungs:* By Dr. BRINTON, Physician to the Royal Free Hospital. (*Lancet*, Feb. 28, 1857.)—The following case possesses considerable interest, both from its bearing upon the symptomatology of the respiratory organs, and from its connection with those phenomena of the sympathetic system of nerves respecting which both pathology and physiology have at present much to learn.

CASE.—S. W—, an unmarried woman, æt. 22, had suffered, during about three months, from slight cough, attended with little or no expectoration, but with some emaciation, and with amenorrhœa. Her family was free from phthisical taint. Her habits were temperate; her occupation that of a laundress; her circumstances latterly so straitened as to reduce her food below its customary standard of quantity and quality.

About a month before her admission into the Royal Free Hospital, she was suddenly seized with the severe symptons from which she dated the present illness. Her cough became violent, and was accompanied with pain in the region of the upper half of the sternum, as well as with expectoration. She lost all appetite; her strength was prostrated; and gradually becoming worse, she applied and was admitted an in-patient on the 25th of January.

At this time her aspect was that of a person suffering from some acute pulmonary disease. Her face, pale and somewhat emaciated, had a haggard, anxious look, and her nostrils worked almost convulsively with each inspiration. Her lips were of a blue tinge, suggestive of partial asphyxia. Her skin, though hot and dry over the trunk, was colder than natural at the extremities. Her pulse was about 120 per minute; her breathing about 36; and both inspiration and expiration (but especially the latter act) gave rise to a mucous rattle, audible at some distance from her bed, and precisely like what is vulgarly known as "the deadrattle" that immediately precedes the final agony. The voice was feeble but distinct. Her cough was frequent, and somewhat paroxysmal in character; but though loose enough to suggest an easy expectoration, this expulsive act was rarely effectual, being repeated several times before it hawked up a dull-yellow, opaque, puriform, and somewhat nummular sputum.

On examining the chest, there seemed no deficiency of movement on either side, although a forced inspiration decidedly bulged the left side a trifle more than the right. The vocal thrill was equal on both sides. The vocal resonance was somewhat more distinct on the right, especially in the subclavian region, where there was slight dulness to percussion, and where the inspiration was rather louder, harsher, and more tubular than elsewhere, and the prolonged expiratory murmur somewhat similarly affected.

It was not, however, without some difficulty that these sounds could be verified. All of them were veiled and nearly lost in the mucous rattle before mentioned, which was heard over the whole chest as a large loud sound of low tone, with irregular remissions of intensity, but scarcely any real interruptions or intermissions. It was loudest during expiration. It never approached to a liquid or bubbling sound. It was utterly unlike the harsh, snoring sound sometimes produced by aneurismal interference with the larynx. Its distinctness increased as it was traced towards the manubrium.

Besides this sound, a little mucous crepitation occupied the more depending parts of both lungs—namely, the lower lobes posteriorly.

The heart, rather large and weak, appeared to be otherwise quite healthy, as did also the larger vessels. The integuments, including those of the face, were flabby and almost puffy, but there was no anasarca. The urine was scanty and high colored, but devoid of albumen. The bowels rather constipated.

There could be little doubt that the patient was almost moribund on her admission, and past all hope of that reäction which the comforts and the treatment of an hospital sometimes bring about—even in cases where, as in this instance, the desperate state present seems due to neglect or privation almost as much as to disease.

The body, examined about sixteen hours after death, was but imperfectly rigid. On careful dissection, it exhibited the following appearances:

The heart was relaxed and flabby; its left ventricle uncontracted; its right ventricle distended with a tolerably large quantity of dark blood. Its valves were healthy, as were also the large vessels arising from it.

The right lung had not collapsed over about one-third of its anterior surface, including its middle and most of its upper lobe. All this portion of it had a pale-red or flesh-colored hue defined by an abrupt, wavy margin from the neighboring collapsed and healthy-looking pulmonary tissue. A similar appearance, of less distinctness, engaged a very small portion of the anterior surface of the left lung, near its root.

The larynx, trachea, œsophagus, and lungs were next removed in a mass, and subjected to further examination. The diseased portions of lung were nowhere absolutely devoid of crepitation when compressed. But in the amount of this crepitation they contrasted with the somewhat dark and engorged healthy lung in their neighborhood just as remarkably as they did in respect of color. Indeed, all the portions in which this color and consistence were best marked, had a specific gravity enabling them to sink readily in spring-water. Their section allowed the expression of a whitish, albuminous-looking juice from the pulmonary lobules, and of a purulent fluid from the cut orifices of the smaller bronchi. The characters of this pus were identical with those of the matter expectorated during life.

On dissecting carefully around the bifurcation of the trachea, it was found that the anterior aspect of the fork of this tube was occupied by a dense, dull, yellowish-white mass, about half an inch in thickness, of extremely tough and fibrous consistence, and about one inch deep in the vertical direction. The right side of this mass extended along the root of the lung in front of the right bronchus, where it became fused into the fibrous capsule of a calcified bronchial gland, that seemed to bound it in this direction. To the left side it spread, as a layer of rapidly-decreasing thickness, for a short distance over the root of the left lung. Upwards it reached, on the right side, a little way along the trachea, and was loosely connected with an oblong bronchial gland (also calcified in its centre) here: towards the left side, it crossed obliquely over the trachea, to become moulded, with a great and sudden increase in its thickness (here three quarters of an inch), upon the left third of the tracheal circumference, for about an inch and a half, just avoiding the œsophagus and its attachment to the respiratory tube. The areolar tissue attaching the aorta and great vessels to this mass was almost everywhere reduced to a scanty (and therefore rather tense) network; but it was nowhere so deficient as to bring the mass into immediate contact with them, far less to imply any fusion with their coats. But at the left side and lower part of the trachea, the mass was completely agglutinated to this tube, resting upon it by a firm immovable union, which evidently depended on the complete involvement in the disease of the normal areolar tissue; so that a section showed the cartilages of the trachea immediately bounded by the new substance. Just at this line of junction the mass was in one place softened, and apparently detached from the subjacent cartilage. The exact degree in which the calibre of the trachea had been diminished by the pressure of this adventitious deposit, it was difficult to determine after laying open the tube. But there could be no doubt that a considerable effect of this kind had obtained during life. Indeed, even after removing the lungs from the body, and thus relieving the parts of that surplus pressure which the pulmonary deposit must probably have brought about, the influence of the mass on the trachea was well shown by its separating the adjacent rings of the adherent trachea to a distance from each other amounting to at least twice or thrice that elsewhere intervening between the neighboring cartilages. This local elongation of the trachea must obviously have sufficed to effect a considerable diminution of its calibre, such as would impart a much greater efficacy to the further pressure or flattening of the tube by the deposit which occupied its circumference. The inferior laryngeal nerve of the left side was stretched and flattened over the deposit, and was also thickened and redder than natural in the same place. But it was not further involved in the disease.

On examining thin sections of this mass under the microscope, with the aid of various reagents, it could be seen that it consisted of an adventitious deposit, for which the original areolar tissue constituted a kind of stroma. The new mass was, in fact, imbedded in the old areolar network, the white and (especially) the yellow elements of which were visible in the form of tightly stretched meshes, the interstices of which were so distended with the adventitious substance that they could only exhibit their ordinary curling and hooked appearance at the extreme edges of any given section. The vessels which could also be seen, were here and there connected with (and apparently occupied by) large compound cells, closely resembling those of the spleen, and, like them, containing what appeared to be blood-corpuscles in various stages of disintegration. The new substance itself consisted chiefly of delicate and indistinct fibres, analogous to the ordinary fibrous development of plastic lymph; with this fibrous mass, however, were mingled so many granular and indistinctly nuclear particles, so as to give the whole a somewhat larger amorphous constituent than is usually found in new fibrous tissue. Near the softened part, this amorphous element was more abundant, so much so as almost to suggest its approximation to the characters of tubercle.

The pulmonary disease—which though nowhere traceable by direct continuity into the tracheal, approached very near it, and, on the right side, increased in intensity almost directly with this propinquity—offered some analogies with the tracheal. The lung was infiltrated with a large quantity of albuminous fluid, in which were floating pus-cells and "mucus corpuscles," together with innumerable epithelial cells. The latter were evidently the ordinary epithelia of the pulmonary lobules, abnormal in nothing save in their quantity, and in the polyhedral forms which close packing had forced them to assume. The lobules were indeed many of them almost stuffed with these epithelial particles, which, adherent to the lobular membrane, had either been washed out or broken down in the centre of the lobular cavity. The capillaries of the diseased lung were singularly empty of blood corpuscles; while they were almost everywhere bulged, at short intervals of their length, by large ($\frac{1}{1200}$ in. diam.) cells containing refractile granules, like the more sparing and less uniform bodies of the same kind found in the tracheal deposit. In some instances the membrane enclosing these granules appeared to be deficient over part of their exterior: rarely it was absent all around them, so that they were merely granules aggregated into a spherical mass, not enclosed within a cell-wall. They seemed to be nowhere free in the lobules, except under circumstances which referred to its extravascular site to accidental violence. No destruction or lesion of lobular tissue could be detected.

7.—*On the determining causes of Vesicular Emphysema of the Lungs:* By Dr. JENNER, Physician to University College Hospital, etc. (*Medical Times and Gazette*, Jan. 24, 1857.)—After referring to the importance of ascertaining the determining cause of pulmonary vesicular emphysema as a guide for its prevention, and to the predisposing influence of all changes in the structure of the lung which impair its contractility, the author adverted to the fact, that the only force capable of unduly dilating the air-cells called into play during respiration is the pressure of air on their inner surface. He then briefly recapitulated the inspiratory theory at present generally received, and quoted the following passage from the latest exponent and most powerful advocate of that theory: "The act of exspiration tends entirely towards emptying the air-vesicles, by the uniform pressure of the external parietes of the thorax upon the whole pulmonary surface; and even where the air-vesicles are maintained at their maximum or normal state of fulness by a closed glottis, any further distention of them is as much out of the question as would be the further distension of a bladder blown up and tied at the neck by hydrostatic or equalized pressure applied to its entire external surface." The object of his paper, Dr. Jenner states, is to show, in opposition to these views, that the force called into play by powerful expiratory effect is by far the most common and efficient cause of vesicular emphysema of the lung. Powerful expiration is, Dr. Jenner affirms, infinitely the most frequent determining cause of acute vesicular mphysema, and of the chronic vesicular emphysema, which accompanies chro nic bronchitis. It is probably the constant determining cause of the vesicular emphysema which supervenes on chronic congestion of the lungs and bronchial tubes, and on diseased heart, and of the atrophous emphysema of the aged, and the invariable determining cause of vesicular emphysema whenever it is general, or occupies chiefly or only the apex and border of the lung, and whenever the dilatation of one or more vesicles is extreme. Dr. Jenner denies that during expiration every part of the lung is equally supported and equally compressed, and he affirms that the apex, the anterior margin, and the margin of the base, and some parts of the root of the lung, are at once imperfectly supported, and comparatively or absolutely little compressed only during expiration. The thoracic parietes covering those parts of the lung which are the least supported and compressed, are those which are seen when a person makes a powerful expiratory effort with a closed or imperfectly open glottis, as in hooping-cough, croup, and hypertrophous emphysema, to be driven outwards. These same parts are the most common seats of emphysema. Three cases are detailed by Dr. Jenner in illustration of his position. In proof of the force exerted on the air-cells of the lungs when powerful expiratory efforts are made with a closed glottis, mention is made of the well-known fact, that during the expulsive efforts of labor one or more cells occasionally give way. In a postscript, the author mentions that he had examined several horses for the purpose of ascertaining whether the parts of their lungs affected with vesicular emphysema were situated in those parts of the thorax the least supported and compressed during expiration, and that in all he found such to be the case.—*Ranking's Abs.*, 1857.

8.—The British and Foreign Medico-Chirurgical Review, quotes from Mr. Alex. H. Johnston's new work "*On the Geographical Distribution of Health and Disease,*" the following statement concerning consumption:

It originates in all latitudes—from the equator, where the mean temperature is 80°, with slight variations, to the higher portion of the temperate zone, where the mean temperature is 40°, with sudden and violent changes. The opinion long entertained, that it is peculiar to cold and humid climates, is founded on error. Far from this being the case, the tables of mortality of the army and navy of this and other countries, as well as those of the civil population, warrant the conclusion that consumption is more prevalent in tropical than in temperate countries. Consumption is rare in the Arctic regions, in Siberia, Iceland, the Faroe Islands, the Orkneys, Shetlands, and Hebrides. And in confirmation of the opinion that it decreases with the decrease of temperature, Fuchs shows, from extensive data, that in Northern Europe it is most prevalent at the level of the sea, and that it decreases with increase of elevation to a certain point. At Marseilles, on the seaboard, the mortality from this cause is twenty-five per cent.; at Oldenburg, eighty feet above the sea, it is thirty per cent.; at Hamburg, forty-eight feet above the sea, it is twenty-three per cent.; while at Eschwege, four hundred and ninety-six feet above the sea, it is only twelve per cent.; and at Brotterode, eighteen hundred feet above the sea, 0.9 per cent. It is calculated that in the temperate zone, within which nearly all the civilized inhabitants of the globe are located, at least one tenth of the population die of this malady. It is uniformly more fatal in cities than in the country. In England, the excess in cities is equal to twenty-five per cent. The greatest mortality occurs from the age of fifteen to thirty.

The Review adds:

Respecting consumption in the United States climate, Dr. Forrey has also established, by numerical facts, that the number of consumptive cases which originate in summer are not less than those of winter; and that the frequency of the disease in the United States army, located in the warmer, moister, and more uniform climate of East Florida, (as in our own army in Jamaica and the West Indies,) is greater than in the more inclement northern regions of America or Canada. By the statistical reports of the British army, it appears that the proportion of attacks in Jamaica and the West Indies is 12.5 per 1000, but in Canada and the United Kingdom only 6.5. In the southern divisions of the American climate, the Lower Mississippi and East Florida, the average proportion attacked is nearly 10.5 per 1000; while in the most inclement regions of the north, the average is little more than 5.0 per 1000.

9.—*Twenty aphorisms in respect of health and healthy respiration, but principally in reference to Consumption and Scrofula:* By HENRY M'CORMAC, M. D., of Belfast, Ireland.—1. All animals that breathe, all warm-blooded animals in particular, are under a constant incumbency to respire a pure fresh atmosphere.

2. A pure atmosphere is necessary to the conversion of venous into arterial blood. It is necessary in order to get rid of the else continually accumulating detritus or waste of the system, which, by a wonderful provision, is intended at once to be got rid of, and to serve as fuel; in other words, to leave the blood pure, and to maintain the entire organism at a temperature of 100° F.

3. The waste, however, will not be sufficiently got rid of, nor will the animal warmth be properly kept up, unless the respiration be a healthy respiration. Now, there cannot be healthy respiration without pure air.

4. It is necessary to healthy respiration that the same atmospheric air should not be breathed oftener than once. If breathed oftener than once, and if habitually so breathed, it leads to disease.

5. Nature, if permitted to do so, conveys away the air fouled by respiration, purifies it through the instrumentality of vegetation. Until this be done, air that has been breathed is not fit to breathe again.

6. Air once breathed is poison for man and brute, but is food for plants. Air breathed oftener than once is still more poisonous for man and brute, though still more nutritive for plants.

7. Under the open atmosphere, beneath the free heavens, the air which has been once breathed is speedily conveyed away; but in close, ill-ventilated chambers, it is retained, and consequently is breathed not only oftener than once, but frequently many times oftener than once.

8. Air breathed oftener than once becomes surcharged with carbonic acid gas, the result of combustion, and with other waste excretions of the frame. When this surcharge of impurity amounts to eight parts in the hundred, or 8 per cent., of carbonic acid gas, the respired air will take up no more waste. Here the waste is retained in the system, and, if the evil process be continued, eventually leads to disease. Air only once breathed becomes loaded with four parts in the hundred, or 4 per cent., of carbonic acid gas, whereas the natural atmosphere contains only one volume in a thousand, $\frac{1}{1000}$ or 0.001 of carbonic acid gas, and according to some estimates even less, in which state it is best fitted, and indeed is alone fitted for healthy respiration.

9. Anything, therefore, which prevents the access of a healthy atmosphere to the lungs, or which deteriorates the atmosphere which does find access, is productive of disease, and sooner or later, if the evil influence continue, of death!

10. Day ventilation, however desirable, will not adequately suffice without night ventilation also. A large amount of breathing space is obviously preferable to a small amount of breathing space; but no amount of breathing space can supersede the necessity of an interchange, night and day, and continually, of the air of the rooms in which we live, and breathe, and sleep, and work, with the outer atmosphere. In numberless dwellings, workshops, workhouses, and asylums, the air breathed, irrespective of various stenches and impurities, is deteriorated to the extent of two, and in some instances, nearly three per cent. of carbonic acid gas. Respiration in such dwellings, workshops, and asylums, where there is no provision or no adequate provision for replacing the tainted air as fast as it forms, with air pure, fresh, and untainted, is simply death, sooner or later, and from this cause, to the inmates!

11. In houses, dwellings, rooms, as constrncted, arranged, and inhabited, the air too commonly is more or less impure, and consequently unfitted for healthy respiration. The evil of foul air, therefore, extends to the living inhabitants of these abodes, to man and man's offspring, as well as to the lower animals which for his use or pleasure he domesticates beneath his roof.

12. In man and brute alike, the impnrities not being properly eliminated by the lungs, so far as the lungs are called on to perform this office, are retained in the system, retained in the blood. When a certain pitch or degree of impurity is arrived at, the waste not being healthily and naturally got rid of, is laid down throughout and within the system, where it accumulates in points till it become obvious on examination to the naked eye. In this state it has received the technical denomination of tubercle.

13. The retained animal waste or excretion which bears the name of tubercle, has no organization, no trace of life or vitality. It is to the system what the offal and mud heaps are in our public ways and thoroughfares, only that in the one case the waste is properly thrust *out* of our dwellings, whereas in the other it is most improperly and undesirably retained *in* the frame.

14. This tnbercle waste or excretion, at certain stages, has very much the aspect of rotten cheese or other decayed and dead animal matter, and acts not only as a foreign body, but virtually as a poison in the system or organism where it has no bnsiness whatever to be, and in the long run, whether in man or brute, tends invariably to death.

15. When the tubercle waste or excretion lodges in the brain or its membranes, it induces, or tends to induce, hydrocephalns or water on the brain, in some cases convulsions. When it betakes itself to the knee it induces white swelling. When it is seated in the hip it induces hip-joint disease. When it lodges in the spine it causes spinal disease. When it finds its way into the joints or bones of the foot, or hand, or wrist, or ankle, or shoulder, or elbow, it produces disease in these parts, one or more. When tubercle waste fastens on the ear, it causes, or often causes, loss of the ossicula, impairment or loss of hearing. When it settles in the eyes it produces scrofulous ophthalmia. When it affects the larynx, as in laryngeal phthisis or consumption, it impairs the voice, and finally takes away life itself. Tubercle in the numerous small glands

of the mesentery, or between the intestines, causes mesenteric disease, the *tabes mesenterica* or mesenteric consumption of the old physicians. When tubercle besets the throat or implicates the skin and subcutaneous tissues, it bears the well-known designation of scrofula or king's evil, *the* evil! And when the tubercle waste or excretion is lodged in the lungs, conjointly or not with other organs, it causes consumption, decline, or decay, as it is variously named, the most frequent and destructive of all maladies.

16. The horse, the cow, the dog, the cat, the rabbit, singing birds and others, when subjected to the conditions already stated, are severally liable to tubercle deposits. Lions, tigers, apes, and other wild animals, when closely confined in our menageries, all become tubercle infested, and sooner or later, if not otherwise cut off, die therefrom. There is no special English designation for consumption in the horse or cow, but by the French it is termed *pommelière.* When brutes come to labor under deposits of animal excretion or waste, they sicken and languish, as man himself, under like circumstance, sickens and languishes, become unequal to healthy effort, and, unless purposely destroyed, in the end perish.

17. It follows from the foregoing that any and all habits, customs, arrangements whatsover, whether as regards man or the lower animals, that militate against healthy respiration, are to be condemned, and if it be possible superseded. Such habits, such customs, such arrangements, leading as they do to excretion deposits, are just as chargeable with the death of the victims, as a dose of arsenic or other poison, causing death, is also chargeable with the victim's death.

18. To obviate the fatal waste deposit, it is requisite to breathe pure air incessantly; in short, to let it habitually into our dwellings, and to go habitually out into it. It is requisite to clothe the body warmly, to nourish it well, to wash it daily, and at night to yield incessant admission to the fresh untainted atmosphere, so that in respect of purity there shall be no distinction between the air of the sleeping-chamber and the air outside the dwelling. Pure, fresh, untainted night air, the body otherwise being properly clothed, and covered, and nourished, is *not* unwholesome. It is only the night air of the close, unpurified sleeping-chamber that is unwholesome.

19. To say that the air of many sleeping-rooms, crowded perhaps with furniture, hangings, carpets, and living inmates, the windows perhaps not made to open, or at least never opened at their upper portion, bedrooms possibly further reeking with uncleanness, infection, and impurity, to say that the air of such rooms is fitted for healthy respiration, would be to insult the most poverty-stricken intelligence.

20. To avoid waste excretion or tubercular deposits, then, in all their forms and all their disastrous results, it will prove needful to breathe day and daily, day and night in fact, winter and summer, and always, a pure, untainted atmosphere. It will be needful to breathe it ourselves, and to procure it for our children and dependents, as well as for the animals which, for our use and pleasure, the Deity has subjected to our control.—*Am. Med. Gaz.*, August, 1857.

ART. II.—*The Glycogenic Function of the Liver disproved.* Translated by J. P. BARBOT, Apothecary; from the Paris *Gazette Hebdomadaire de Médecine et de Chirurgie*, of August 28, 1857.

ON the 27th July, 1857, Dr. Louis Figuier, *agrégé de chimie*, to the Paris School of Pharmacy, read before the Academy of Sciences, a memoir entitled: New facts and considerations against the existence of a Glycogenic function in the Liver,—from which we extract the following final

RESUMÉ ET CONCLUSIONS:

I deem it proper to condense into the form of simple propositions the facts enunciated in this memoir, all of which concur in disproving the existence of the glycogenic function of the liver.

1st. In order to prove this glycogenic function, M. Bernard laid great stress on the fact that sugar was found in the liver exclusively. It is shown, on the contrary, that instead of existing in one organ exclusively, sugar is found in all the parenchymatous organs that receive blood, such as the heart, lungs, spleen, etc., and also in the blood of the general circulation.

2d. The same physiologist has asserted that no glucose could be found in the chyle. It is now a recognized fact that sugar exists in the chyle of animals fed on meat exclusively, which fact is of itself sufficient to refute the doctrine of a glycogenic action in the liver. In fact, it furnishes us an evidence of sugar formed in the intestinal canal, and thence getting into the general circulation through the chyliferous vessels and thoracic duct, without having entered the liver at all.

3d. To prove this same function, M. Bernard laid great stress on the fact that he found no sugar in the blood of the vena porta. It is now shown that the blood in this vessel contains a product which evidently belongs to the family of sugars; since it exhibits all the characteristics peculiar to the general group of saccharine matters, *i. e.*, it is reduced by the *liqueur cupro potassique*, (Trommer's test); it is not precipitated by the sub-acetate of lead, and it undergoes the alcoholic fermentation after having been boiled with a diluted acid.

4th. The blood of the general circulation contains the same saccharine formation as the vena porta; it is reduced by Trommer's test; is not precipitated by sub-acetate of lead, and ferments after having been boiled with diluted sulphuric acid.

5th. In the human economy, sugar does not constitute an uniform product whose properties are constantly identical, but a series of compounds belonging to the general group of *glucosic* products, which are successively modified, and are at last converted into the fermentable sugar found in the chyle and liver.

6th. In the intestinal canal of animals that have been for months fed on meat exclusively, there is found a compound, of sweetish taste, which after having undergone various chemical changes either in the blood of the vena porta or by the action of the intestinal villi, is perhaps the origin of this fermentable sugar found in the liver and chyle.

7th. Nitrogenous food introduced into the alimentary canal is converted into sugar by a series of decompositions, the theory of which, chemistry explains to us.

ART. III.—*Physiology of the Spinal Cord:* By M. CHAUVEAU. Translated from the *Gaz. Heb. de Méd. et Chir.*, of Sept., 1857: By J. P. BARBOT, Apothecary.

M. CHAUVEAU, of Lyons, read a paper in the Academy of Medicine of Paris, on *the study of the functions of the spinal marrow*, a summary of which follows.

The author's aim in this work was to combat the new ideas announced on this subject, by M. Brown-Séquard.

In the first part of his work, M. Chauveau examines whether it is true that *sensitive impressions pass from one side of the spinal marrow to the other, on reaching this organ previous to their passing on to the common sensorium.*

According to M. Brown, not only is sensibility preserved, but there is hyperæsthesia on the side and in the rear of the section; and insensibility on the opposite side. M. Chauveau maintains: 1st, that the motions produced by irritating the member on the side of the section, are due (even when they are generalized in the whole trunk,) to a reflex action; 2d, that when pain exists, the phenomenon is complex; there is at the first reflex contraction, then pain produced by this contraction, as he has been able to convince himself frequently by experiments, and particularly in solipeds.

He formally denies the assertion of M. Brown that there is insensibility on the opposite side; he witnessed pain always and in all the animals that he experimented upon. In proof of his statements he exhibited to the Academy two pigeons in which the right lateral half of the spinal marrow had been divided on a level with the dorsal curve, and which, when pinched on the left side, exhibited keen sensibility.

In a second part of his memoir, M. Chauveau examines whether it be true that *the sensitive impressions are conveyed to the brain by the central grey substance*, and in this also his conclusions differ from those of M. Brown. If, in an animal, in which the anterior and posterior fasciculi and the lateral fibres of the spinal marrow have been divided, in such a way that the grey substance alone has been left untouched, we still observe some signs of pain; this is not, he says, produced by direct irritation but by irritation communicated to organs still possessed of sensibility—producing automatic contraction and subsequent pain. The conclusions of M. Chauveau are: 1st, that sensitive impressions do not cross one another on reaching the spinal marrow; 2d, that they are not conveyed to the brain by the central medullary grey substance.

M. Chauveau observes that if the principles laid down in the above conclusions are opposed to those of M. Brown, a majority of the facts observed by that able experimenter are nevertheless exact and of the greatest interest. They were only more complex than M. Brown thought them to be.

By studying the reflex phenomena, in a novel manner in many respects, M. Chauveau has been enabled to reduce these facts to their simplest expression and show their true signification. (*Commissaires:* MM. Longet, Bérard et H. Boulay.)

Art. IV.—*Progress of Anæsthetics.*

1.—*Chloroform. Archives Générales de Médecine:* Translated by Stanford Chaillé, M. D.—Dr. Ludger Lallemand, whose report on chloroform has justly excited a very lively interest, has addressed to the Academy of Medicine a letter, which we reproduce almost entire, because it sums up the conclusions of his report presented to the Society of Emulation.

The following are the results of our experiments upon animals appertaining to different classes of vertebrata, some of which results are very different from those stated by other experimenters, namely:

The action of chloroform is in direct ratio to the activity of the respiration and circulation. The rapidity and intensity of the anæsthetic phenomena are also in direct ratio to the quantity of chloroform administered in the same time, that is to say, to the degree of concentration of the inhaled vapors; but they are identical in their nature and order of development.

Chloroform, by an affinity of election accumulates in the nervous centres, the excito-motor powers of which it suspends, as also the sensibility and motor power of the cerebro-rachidian nerves; chemical analysis proves that the brain and spinal marrow contain about ten times more chloroform than the blood, and the vascular organs, as the liver.

Under the influence of chloroform, we have always seen the respiration cease before the circulation; the cardiac and arterial pulsations have continued from one to six minutes after the disappearance of all respiratory movements.

We have seen all animals die that we have abandoned, after the disappearance of respiratory movements, the circulation being still active.

We have restored to life, ten times in twelve, dogs and rabbits by pulmonary insufflation, by breathing into a sound introduced into the trachea; the insufflation having been applied only after the cessation of the heart's contractions, and having been continued, until respiratory movements were aroused.

Insufflation acts by eliminating artificially the chloroform, and by stimulating the excitability of the nervous system. Chloroform is very rapidly eliminated from the organism; this elimination is normally effected by the pulmonary surface, and the cutaneous surface takes but a very limited part therein. Death can be explained neither by paralysis of the heart, nor by asphyxia due to the insufficiency of air penetrating the lungs during etherization, for we have caused death with the succession of the phenomena above mentioned, by injecting chloroform vapor into the jugular vein; farther, we have restored to life dogs, whose hearts had ceased to beat, by the insufflation of nitrogen gas (*gaz azoté*).

It is true that the necropsies have shown a plethoric state of the vascular system from black blood, analogous to the condition observed in asphyxia; but this fact results from the persistency of the heart's action, and from the diminution of the permeability of the lungs in consequence of the arrest of the respiration, a double phenomenon which produces the accumulation of blood in the right cavities of the heart.

It appears to us that death has its first cause in the abolition of the functions of the nervous centers, losing successively their vital powers under the stupefying action of chloroform, which has accumulated in the cerebro-rachidian mass.

As the intensity and rapidity of toxical action are proportionate to the concentration of the chloroform vapor, it appears to us indispensable, for the security of surgical anæsthesia, that it should be diluted with as large a portion of atmospherical air as is possible.

II.—*On Ocular Anæsthesia:* By M. CHASSAIGNAC, Surgeon to the Hôpital Lariboisiere, Paris.—[M. Chassaignac believes that chloroform is destined to render great service in the treatment of ocular diseases, provided its mode of action be thoroughly understood. He has examined carefully the influence of this agent on the eyelids, conjunctiva, on the motions of the eye, and also on the contractions of the iris.]

1. When the process of inhalation has been carried sufficiently far to obtain muscular resolution, the constant effect of chloroform is to render the eyeball completely motionless. This symptom is by far the most constant of all, since the dilatation of the pupil undergoes numerous variations, and is sometimes succeeded by contraction, in the most advanced stage of anæsthesia.

2. Another phenomenon, which appears equally to deserve notice, especially as regards the operation for cataract, is, if we may borrow the expression of Barthez, the "power of fixity" which the eye acquires under anæsthetic influence; whatever its position may happen to be when the state of anæsthesia begins, that position is invariably retained throughout the whole duration of the experiment. During the period of insensibility, the eye is usually turned upwards, and lies concealed under the upper eyelid; it then becomes quite impossible to move it by the mere pressure of the fingers, without the assistance of an instrument—a fact of the highest importance, since it might in certain cases become an obstacle to the operation for cataract.

The two preceding propositions may at first sight appear identical, "immobility" and "fixity" being synonymous; but if language establishes no great difference between the words, clinical facts do so, and in the following manner. If we compare the state of the eye on the dead body with that under which it is placed through anæsthetic influence, we find that the eyeball on the dead body lies no doubt motionless, but the fingers easily move it in any given direction; we can incline it downwards, upwards, right or left, without difficulty. In the state of anæsthesia, not only is the eyeball motionless, but it lies fixed in a determinate position, which the pressure of the finger Is totally insufficient to alter. As a whole, the eyeball may of course be displaced, but it ceases entirely to revolve either on its vertical or on its transverse axis. This fact, which is of the highest importance in a physiological point of view, is worthy of attention. It is evidently due, in our opinion, to the simultaneous tonic contraction of the four recti and the two oblique muscles, which maintain the eye in a state of perfect immobility. Is it not, however, an interesting fact to the physiologist, that while chloroform places the muscles of the entire body in a state of resolution, its action should be directly the reverse on the muscles of the eye, which enter, under its influence, into a species of spasmodic contraction, entirely at variance with the general state of the patient?

3. The immediate consequence of the above-mentioned fact is the tendency of the humors contained in the different chambers of the eye to escape as soon as the membranes which surround them are divided.

4. The action of chloroform on the eye may be divided into two distinct periods, the results of which ought not to be confounded—1st, during the state of excitement; 2ndly, during the state of collapse.

Irritation is the first effect produced by chloroform on the conjunctiva; we therefore see most patients close their eyes during the first period of inhalation. The next result is, a modification of the contractile powers of the iris; and this exceedingly complicated part of its action deserves special attention. During the first period of anæsthesia, and consequently in the stage of excitement, chloroform produces a considerable dilatation of the pupil; but, strange to say, at the moment when insensibility is complete, the pupil, formerly dilated, contracts a few instants after the eyelids are opened. This physiological action seems to belong to the singular class of phenomena described under the name of reflex actions; for in that stage the brain receives no luminous impressions from without. We therefore see that surgeons who expect to find the pupil expanded under the influence of chloroform might be considerably surprised by the phenomena we have just described. This fact has led us to state in another paper that chloroform is a bad dilator of the pupil.

5. The eyelids present another singular phenomenon, equally deserving our attention, and which we have described under the name of "immobilité cadavérique des paupières." In a certain number of cases, when anæsthesia has been carried to a considerable extent, the eyelids remain motionless, and if opened do not close again. This remarkable fact appears almost alarming to those who witness it for the first time. So great is the absence of muscular tonicity that it seems impossible the vital powers should not be deeply endangered after spontaneous action has so completely disappeared.

6. Another fact, which should always be present to the operator's mind, is the sudden re-appearance of the pupillary contraction, according to laws hitherto unknown. The pupil is often seen to contract after considerable expansion, without any known cause. This takes place in the operation for cataract, after the lens has been removed.

7. The age of our patients does not seem to exercise any definite influence upon the general results of the experiment; it seems, however, that constitutional debility facilitates the action of chloroform upon the eye, the patient's vital resistance being considerably diminished.

The study of these peculiar phenomena is far from being so easy as one might be led to imagine. There exist innumerable difficulties and causes of error.—*Lancet*, *Braithwaite's Retrosp.*

III.—*On the Vapor of Amylene in Midwifery.*—[This substance is yet upon trial at the various London Hospitals, but a positive opinion cannot yet be pronounced upon its merits.]

There is one thing that should be remembered when giving it, and that is, to use an inhaler, and not a mere piece of lint. How well soever this may occasionally answer with chloroform, it does not do so well with amylene. It has already been used in midwifery practice by Dr. Tyler Smith with the most satisfactory results. He has observed to us, that he administered it on a folded towel, to the extent of about thirty, forty, or fifty drops at a time, on the coming on of each pain.

It produced rapidly a state of insensibility to pain, the uterine contractions remaining undiminished in force and frequency. The recovery of sensibility after pain was over, and the towel removed, was always almost instantaneous. At the time of the birth of the child, the insensibility was as complete as though chloroform had been nsed. The placenta was detached, and camc away readily, and the uterus afterwards contracted well. The pulse was fonnd to be little, if at all affected; the child was vigorous and healthy, and did not seem at all influenced by the anæsthetic. Dr. Tyler Smith thinks the advantages, as compared with chloroform, in midwifery, would seem to be the suddeness of its influence and its asserted safety, and the rapid disappearance of the insensibility after the amylene is withdrawn. The only disadvantages he could perceive are the pungent smell and the large quantity consumed.—*Ibid.*

IV.—*Use of Chloroform in Retention of Urine.*—An intemperate cabman, aged 52, was admitted into a medical ward at Guy's, a few days ago, on acconnt of chest symptoms. It appeared that he had had gonorrhœa twelve years before, and had ever since had more or less difficulty in passing his water. After having been in the hospital nearly three weeks, he was seized with retention of urine. The dressers and honse surgeon made patient and repeated attempts to pass a catheter, but without resnlt. There was little doubt that the stricture was a permanent one, which had been closed by inflammation. In February the retention had become complete for two days; the symptoms were becoming very urgent, and Mr. Cooper Foster was accordingly called to see him. Opium had been most freely given. Having failed in persevering attempts to introduce a No. 2 catheter, Mr. Foster determined to administer chloroform, and, if needful, to puncture the bladder by the rectum. When completely insensible, another trial was made with a No. 3, which now passed most readily. We cite this case as important, because it proves beyond dispute the influence of the anæsthetic state in relaxing an otherwise impermeable stricture. An opiate treatment had been fairly tried before, and had failed, and the catheter had also been found useless in the hands of several well-practised snrgeons. The plan of administering chloroform in cases of obstinate stricture and retention, is one in wide use, both in hospital and private practice; but, as it is not yet in such general favor as it deserves to be, we have thought that so pointed an example of its advantages might be worth bringing before our readers.—*Med. Times and Gaz.; Cincinnati Med. Observer.*

V.—*On the anti-hemorrhagic action of Chloroform during operations:* By M. Chassaignac, Snrgeon to the Hospital Laribosière, etc.—It is impossible for surgeons, who have performed a great number of operations with the assistance of chloroform, not to have been struck by the small quantity of blood lost during severe operations by certain subjects snbmitted to the action of this anæsthetic. It is for my part a remark that I have made a long time back. Without otherwise attaching importance to this particularity, I have not been ablc to prevent myself comparing the smallness of these losses of blood with the extent of those which have taken place during great operations performed without the assistance of chloroform. Reflecting on the mechanism, in virtue of which could be produced such a result, I understood very quickly that a subject in whom the physical and moral excitement caused by an operation accelerated the pulse to 120, ought by an open artery to lose more blood than the one who had only 60 pulsations a minute. I believed that I had found in this fact something very advantageous, and of direct application to practice, with respect to hæmorrhages that take place during operations. But to draw conclusions, and, above all, conclusions applicable to practice, something else besides impressions and reasonings, however plausible they might be, was necessary. I resolved, then, to submit to special observation a certain number of patients operated upon at the Hospital St. Antoine. It is the result of these operations which I desire to submit to the attention of surgeons. Eleven subjects, of whom three underwent amputations of the thigh, four of the breast, one of the leg, one an entire resection of the first metatarsal and of the first cuneiform bone, one a resection of the humerus, and one of the inferior maxillary bone, have furnished me the occasion to state that, whether in the period of collapse or in the period of anæsthetic tolerance, the losses of blood which constantly attend similar operations were enormously lessened, and that particularly in two cases (an amputation of the breast in a woman, and of the thigh in a man) the operation was performed, so to speak, without any loss of blood. In the latter case, it is true that the compression of the femoral was made with great exactitude; but that which proved to us that the chloroform had a considerable share in these results was, that when I ordered my assistants to suspend compression, all the surface of the wound, with the exception of the principal artery, which furnished a very moderate jet, gave but a very inconsiderable quantity of blood, and that we were obliged to wait for the cessation of the anæsthetic state to render possible the ligature of the secondary arteries. As to the patient with the amputation of the breast, who was a little more than twenty years of age, and had come to be operated upon for an adenoid tumor of the right breast, there did not literally flow a teaspoonful of blood during the operation. I was wrong here in not waiting for the awakening of the patient before proceeding to the dressing, and it is worth remembering, that there happened a hæmorrhage which did not show itself until a certain time after the application of the dressing, and several hours after the patient had been taken back to her bed. It is not only with regard to arterial hæmorrhages that chloroform can be considered as diminishing loss of blood; it is with respect also to those of a venous character. We know in fact, that the badly restrained struggles of a patient, dispose him in a particular manner to venous hæmorrhage; for he is under the influence of two causes which play a considerable part in these sorts of hæmorrhages—first, an imperfect respiration; and secondly, energetic muscular contraction. Chloroform removes these two causes, but only by producing collapse or anæsthetic tolerance.

If we wish to render a rational account of the means by which happen the phenomena which occupy us, it will be sufficient to compare briefly the state of a patient operated upon under the ordinary conditions with that of one who has arrived at the period of tolerance. With the first, the fear of the operation about to be performed hurries the pulsation, increases the force of the impulse of the walls of the heart, and retards the free arrival of venous blood, not only in consequence of the impediment brought to respiration, but also by the efforts which the patient makes.

Thus, increase in the number of pulsations, augmentation in their intensity, stagnation of the venous blood, such are the circulatory conditions of the patient who submits to an operation without the employment of anæsthetics.

If these have been administered, what do we see? The pulse is less frequent and less strong, and there is a normal state of the respiration and venous circulation.

In comparing situations thus opposed, it is not difficult to understand the difference of results with regard to the hæmorrhagic tendency.

Let us examine now what conclusions we can draw for practice from what has just been laid down. In this respect, and as the result of our observations, we might note—

1st. That the sedative action of chloroform during the period called tolerance diminishes in the patients—

A. The number of pulsations.

B. The force of the impulse of the beats of the heart.

C. The stasis of the blood, the cause of venous hæmorrhages.

2d. That the diminution of hæmorrhage during the period of tolerance can render real service in the cases of operations which suppose the possible opening of a great number of vessels.

3d. That if it is sometimes useful, as has been recommended by some surgeons, not to make the dressing until a certain time after the operation, this advice becomes, so to say, obligatory after the employment of chloroform, the chances of an ulterior hæmorrhage being so much the greater as less blood has been lost during the operation.—*Ibid.*

VI.—*Death from Chloroform.*—[In a case which occurred at St. Thomas's Hospital, and which caused great excitement, the following were the opinions of the medical gentlemen examined by the coroner, as to the propriety of giving it in such a case, the man being in delirium tremens.]

Mr. Solly saw the patient the day previous to the operation, and he thought him a healthy subject. Mr. Simon also agreed generally in this opinion. Mr. Simon was under an impression that the death was epileptic in the present instance, and as no person could, in the usual routine of hospital practice, discriminate such patients, he believed everything that was right had been done. As regards *delirium tremens*, Mr. Simon believes we want facts; but its striking analogy to some of the worst forms of epileptic and hysteric seizures would make him cautious. Mr. Paget conceives the existence of *delirium tremens* to be a very strong contraindication to the use of chloroform—indeed one of the strongest. Mr. Solly, on the opposite hand, agrees with Dr. Snow; and as chloroform is a cure for *delirium tremens*, he would not be afraid to give it to such cases. That drunkards require more chloroform is the experience of Guy's Hospital; and hence *delirium tremens* patients may get an overdose, or the cumulative dose may kill when least expected—may strike more suddenly on some internal organ. This practical remark is due to Mr. Callaway. Dr. Black is inclined still to believe that patients are asphyxiated in chloroform, as in carbonic acid; and, as drunken patients, or those under delirium tremens, are too often impassive to surrounding circumstances, they may get an overdose without making the nsnal resistance.—*Asso. Med. Jour.*

VII.—*Simple Method of Preventing Accidents from Chloroform.*—[The following plan is rcommended by a correspondent of the 'Medical Times and Gazette' as one which the author has found uniformly successful both in midwifery and snrgical cases. He says:]

Although I have nsed it at least one thousand times, I have never seen the least bad consequences follow from it, and I consider that this sneccss depends greatly on the precaution I take before administering the chloroform; this simply consists in administering a glass of spirits or wine—I prefer the former, even to ladies. The wine, or spirits, seem to exercise no effect on the chloroform, while their stimnlating quality keeps up the action of the heart during the time the patient is under chloroform, and prevents sinking. I had occasion some years ago to perform a slight surgical operation on a lady who was fearfully afflicted with asthma and excessively nervous. Her husband being a medical man, now in the west-end of London, objected to the use of chloroform in such a case, but I assured him that the wine would prevent any evil happening. The operation was performed, the patient saved from the pain of it, and to her great relief she had no return of asthma for a long time, and when it did return, she had recourse to the chloroform, which, for a time, gave her great relief. On one occasion, while I was removing a scirrhous tumor, the patient, who was rather advanced in life, got an overdose of chloroform, and we had great fears of her being permanently roused, and I do believe her recovery was owing entirely to injecting a glass of brandy and water into the rectum. The accident happened owing to the gentleman who had charge of the chloroform getting so interested in the dissection, that he forgot to raise the towel off her face till respiration had become imperceptible. However, she soon rallied.—*Med. Times and Gazette; Braithwaite's Retrospect*, 1857.

VIII.—*On the deaths following the inhalation of Chloroform in surgical operations:* By T. HOLMES, Esq., F. R. C. S., Surgical Registrar to St. George's Hospital.—These papers contain the records, carefully tabulated, of fifty deaths nnder chloroform, occurring dnring the years 1848–55 inclusive, in thirty-nine of which post-mortem examinations were made, and in the great majority of which the chloroform was given by qualified medical men. These records are compiled after a careful search through the volumes of the medical periodicals published at home and abroad; and Mr. Holmes states that he has not wilfully omitted any, except two, both of which were extracted from non-medical papers without any guarantee as to their authenticity—one evidently an American hoax.

The following facts arise out of this inquiry:

1. *Sex.* This is noted in 44 cases; 21 were males, 23 females.

2. *Age.* All were persons in the middle period of life; no children, and only one man above the age of 60.

3. Most of the operations were of a comparatively trifling character.

4. The chloroform was given on a handkerchief, cloth, towel, or piece of lint, in 27 cases; in a sponge in 4; in an inhaler or other apparatus (not described) in 8; on Dr. Snow's inhaler in 3. In 8 cases the apparatus is not specified.

5. The quantity nsed was ʒj and under in 13 cases : ʒij and under in 12 ; ʒij–℥ss in 3 ; a large quantity in 8 ; not specified, 14.

6. The time is noted in 32 cases : 2 minutes and under in 15 cases ; 2–5 minutes in 6 cases ; 5–10 minutes in 6 cases ; and above 10 minutes in 5 cases (in one of them, 40 minutes).

7. The symptoms are intelligibly described in 36 cases.

In 19 there was no previous struggle; in all of these, except one, the pulse ceased before or at the same time with the inspiration.

In 17 there was previous struggle ; in 4 of these lividity and failure of respiration was next noticed ; in 13, failure of the pulse, or of the bleeding from the wound, generally preceded by pallor.

8. Of 33 cases in which post-mortem examinations were made :

(*a*) Eight, viz.: Nos. 15, 22, 31, 32, 34, 42, 46, 50, showed no appreciable morbid appearances, *i. e.*, referable to chloroform: for one (No. 34) is said to have presented extravasation of blood in the spinal canal.

(*b*) The *heart* is reported *soft* or *flaccid* in 10 cases, Nos. 3, 9, 16, 19, 20, 23, 24, 27, 30, 46; *fatty* in 9, Nos. 26, 29, 33,* 35, 36, 37, 38,* 41, 45. The case marked thus* were two of the oldest patients in the list, and the morbid appearance seems not to have exceeded the traces of fatty degeneration usually fonnd at that period of life. The heart was *flaccid* and *empty* in 7 cases, Nos. 2, 5, 8, 9, 10, 14, 48; *full* in 1, No. 1.

The *blood* was usually fluid; air was found in it in 3 cases, Nos. 2, 5, 24.

(*c*) The *lungs* were congested in 14 cases, Nos. 1, 2, 5, 8, 9, 10, 16, 19, 20, 23, 28, 45, 46, 50.

(*d*) The *brain* was congested in 7 cases, Nos. 1, 14, 16, 20, 23, 28, 44.

(*e*) *Other viscera* were congested in 6 cases, Nos. 1, 10, 16, 20, 24, 30.

(*f*) There was organic disease in 4 cases besides that of the heart, viz.: aneurism, No. 39; phthisis, No. 3; atheromatous arteries, Nos. 33, 38. The latter had also granular degeneration of the kidneys. It will be observed that the latter two had also fatty degeneration of the heart; but to a slight extent.

In these papers Mr. Holmes' object has been to show what the mortality after chloroform has really been, and to inquire whether the results of *post-mortem* examination have given us any clue for assigning it to its efficient cause—and in reference to these two points the facts appear to show—

1. That the reported mortality in the British Islands has been less than six *per annum;* that a great number of these cases occurred in private practice; and that as many of them were disclosed by means of coroner's inquests, it seems probable, that we do really hear of most of the fatal cases which occur in the United Kingdom.

2. That the post-mortem appearances have not been sufficient to indicate any uniform cause of death; that the importance ascribed usually to fatty degeneration of the heart is greater than experience would warrant; that, from the number of cases of persons previously in perfect health, and the rapidity with which death was produced, there is a strong presumption that the result was due to imperfect methods of administration, or carelessness on the part of the administrator. Further, from the experience of hospitals in which a rational method has been adopted and due caution exercised, we are justified in believing that chloroform is as safe in its action as any drug which produces narcotism by mixing with the circulating blood, can in the nature of things be expected to be.—*British Med. Jour.*

IX.—*On a mode of preventing the fears and apprehensions connected with a Surgical Operation:* By M. DIDAY, formerly Senior Surgeon to the Venereal Hospital, at Lyons.—In one of a series of letters, in which medical topics are treated with great soundness of judgment, M. Diday has lately directed attention, in the *Gazette Médicale de Lyons*, to a very kind mode of lessening the apprehension of persons who have consented to submit to capital operations, and which mode has been put in practice at the Military Hospital of Bordeaux. When it has been settled that a limb is to come off, the precise day is left undecided, and the patient is allowed, if the case admits of it, to forget the painful circumstances. Some morning the house-surgeon, in going round, says to the poor man, "By-the-bye, as you are to be operated upon, you may as well get accustomed to the smell of chloroform, and learn to inhale it." Thereupon he applies the mouthpiece, lets the man quiety inhale the semi-lethal vapor, and allows complete anæsthesia to take place. The patient is then carried to the operating theatre, where everything has been prepared beforehand, and every one is ready for his task. The operation is performed, and the poor sufferer wakes delighted that it is all over, and that he has been saved the pangs of trepidating expectation.—*Lancet.*

X.—*Death from Amylene.*—In the *Medical Times and Gazette*, August 8th, Dr. Snow relates a second case of death from the effects of amylene, the first having been given by him in the number for the 18th of April, of the same journal. Dr. Snow is of opinion that death resulted in this, as in the former case, from the fatal action of amylene upon the nerves of the heart, producing paralysis of the organ; that death in fact commenced at the heart, and not by asphyxia as had been asserted by M. Duvergie. The length of time the patient continued to breathe is very remarkable, spontaneous inspirations being made for three quarters of an hour after the pulse had ceased to be discernible at the wrist. The subject of this melancholy accident was a young men 24 years of age, admitted into St. George's Hospital, to have a small epithelial tumor removed from the back, by Mr. Hawkins, some of a similar kind having been removed upon three occasions and under the influence of chloroform, without any unpleasant result. It appears that in the administration of amylene, care must be taken that the air the patient is breathing should not contain more than about fifteen per cent. of the vapor. Now in the ordinary mode of administering chloroform in amylene, this cannot be regulated exactly, as the vapor is not mingled with the air by measure. In this case it appears that the patient took one or two inspirations of the vapor a little stronger than was intended, and hence the fatal result.

XI.—*Amylene condemned at the Académie de Médecine.*—M. Giraldès having recently sent a paper to the Academy, entitled "Clinical Study of Amylene," MM. Robert, Larrey and Jobert formed the committee to which it was referred. In the report read on the 18th inst., M. Jobert details various experiments and observations he has since made with this substance, both with and without apparatus; and he comes to the conclusion that amylene exerts an energetic and dangerous influence. The statement that has been made, that it is less active than chloroform, is only true when it is administered in the open air, and is explained, he says, by the rapidity of its evaporation. If only a sponge be employed, there are only produced, after a period varying from nine to nineteen minutes, muscular agitation and acceleration of pulse, effects that ensue in from five to seven minutes, if the sponge be placed in a cone of pasteboard. If an apparatus be employed, however, amylene becomes a most energetic anæsthetic, the desired result occurring in two and often in one minute. The effects of this agent are the increase of the number of the pulse by thirty or forty, the modification of the color of the blood, and the perturbation of the nervous system, inducing insensibility, coma, and the abolition of the intellectual power. It is thus a toxical agent, acting simultaneously upon the vascular and nervous systems. M. Giraldès does not advance sufficient proof that amylene is less dangerous than chloroform; and even M. Robert's proposition of employing it in certain exceptional cases is not admissible, inasmuch as amylene possesses the inconveniences, without the advantages, of chloroform. Chloroform does not, like amylene, deprive the blood of its red color; and while chloroform depresses and renders the pulse slower, amylene quickens it, producing congestion of organs. Amylene is of difficult administration, while chloroform is easily given. Chloroform has furnished to M. Jobert the same satisfactory results at all ages, and he believes that it is not more injurious in infancy than at a later period. He proposed that the conclusions of the author in favor of amylene should not be received; but as the communication is interesting in other points, the thanks of the Academy should be returned for it.

M. Velpeau proposed a stronger condemnation of amylene on the part of the Academy; for from the experiments even of the reporter, it was evident that amylene is more difficult to manage, and more dangerous in its results. In the recent case of death from it, there were not the attenuating circumstances adduced for chloroform or ether, such as the want of skill or experience of the manipulator, since it was the inventor himself who directed the procedure. "I maintain that a substance which in so short a time, and in the hands of him who recommends it, is dangerous to such a point, that its employment ought not to be permitted, and I propose that the Academy formally reject it."

M. Larrey observed that he completely agreed with M. Velpeau, and he should have thought that M. Giraldès, after having been present at Dr. Snow's last accident, would have somewhat modified his ideas on the subject.

M. Jobert added, that when amylene is administered on a sponge, anæsthesia sometimes cannot be produced for half or three-quarters of an hour. If Charrière's apparatus be employed, it is rapidly induced, but at the expense of serious accidents. It differs from chloroform in that the insensibility it induces is instantaneous and not progressive. It produces an important modification of the blood.—*Moniteur des Hôp.; Dublin Hosp. Gaz.*, Sept., 1857.

XII.—*On the effect of Chloroform upon the result of Surgical Operations:* By Dr. JAMES ARNOTT.—[Scarcely a hundred instances of sudden death from chloroform have as yet been reported, but we can scarcely doubt that a far greater number have been concealed; but, besides this number, many die within a few hours of its administration, whose deaths have been attributed to other causes. Dr. Mouat, in speaking of soldiers who were operated upon in the Crimea under chloroform, says, that it induces nausea and depression, reäction is never thoroughly established, and the patient frequently dies from exhaustion, in from twelve to twenty-four hours. "Many of these," he says, "may be fairly termed 'deaths from chloroform,' but are never so returned." The most extensive statistical investigations which have been published on this point, are by Dr. Simpson of Edinburgh. From these tables, it appears, that the mortality from amputations immediately before the introduction of chloroform was 29 per cent., and after its introduction only 23 per cent.; but these tables, when closely examined, are found to involve the greatest fallacies.]

The first, which professes to give the average mortality of thirty British hospitals, should have shown the number of operations, and their results, at each of these hospitals during precisely the same period of time; but, instead of this, while the period of observation, as respects the only large healthy hospital inserted in the list, is limited to two years, that of the large, unhealthy hospitals of Edinburgh and Glasgow, the excesssive mortality of which almost equals that of the Paris hospitals, extends to more than three times this duration. If an equal period of observation be taken to form this average, (excluding two of the small hospitals, one healthy and the other unhealthy, on account of the period of observation respecting them being uncertain,) the table, instead of showing a mortality of 29 per cent., would show one of only 24; and, if other large, healthy hospitals, like that at Bristol had been included—such as the Liverpool Royal Infirmary, where (as appears from a published return) the deaths from amputation during three consecutive years, were only at the rate of 6 per cent.—the average mortality of the whole would probably have been considerably less than 20 per cent.

The second table involves no miscalculation so palpable as that in the first, but it leads to conclusions equally erroneous. It gives an account of the number of amputations in which ether was administered, with the results; but what the character of the cases was in which it was used—whether the patients were healthy or worn out with disease—we have no means of judging. In all probability the best cases were generally selected, for only a few were returned from each hospital; and it was natural and proper that at first the best cases should be chosen for trial, not only those free from serious organic disease of the vital parts (a class which were long excluded), but those in which the reparative powers were most conspicuous; and a clearer proof that this was the case cannot be adduced than the fact that the etherized cases from the eight London hospitals inserted in this list, show a mortality of more than 10 per cent. below that which (as we shall presently see) exists at the present day.

But as the prospect of recovery from amputation is good or bad according to the general health of the patient, and other circumstances, if we could always select our cases, the usual mortality would probably be reduced to less than a half. As it is, all the advantage which the 302 etherized cases appear by the table to have over the non-etherized 618 of the other table (admitting the returns to be correct), does not amount to more than 1 per cent. To prove that there was not actually a loss of life, instead of a gain, from etherization, there should have been, assuming that the cases were generally selected, a much greater difference than this. A percentage of 23 deaths from amputation in the English provincial hospitals, even supposing that every case was etherized, would indicate a great increase of the usual rate of mortality before the introduction of etherization.

Another objection to the reception of this table as an argument in favor of the indiscriminate use of chloroform is, that it has reference principally to sulphuric ether as the means of producing anæsthesia, for very few operations had been performed under chloroform at the time of its publication. Now chloroform, whatever other advantages it may possess over ether, has none as regards safety; and, what is of more importance in respect to this table, it has of late years been employed much more boldly than was formerly usual. Patients were then frequently only half intoxicated by the anæsthetic, and the intoxication was kept up but for a short time. A change in this practice had not yet been effected by the singular argument, that, because a patient laboring under convulsions may be kept for a long time under the full influence of chloroform apparently without injury, the same proceeding can be adopted with impunity in the case of a patient exposed to the long-continued danger of a large amputation wound.

We shall now proceed to the consideration of tables of a very different character from the above, as respects their construction, and which disclose facts of a very different import.

Although I had long felt convinced, from reflecting on the evidently poisonous character of chloroform, that the number of sudden deaths produced by it, whether reported or not reported, was by no means the measure of the whole mortality, I was unable to obtain satisfactory evidence of this. It was by statistics alone that this point could be determined, and I had no easy access to the repertories of the necessary facts preserved in hospitals. At last my attention was directed to the Statistical Reports of Operations which have appeared for several years past in the 'Medical Times and Gazette,' by reference to them in Sir Benjamin Brodie's recently published paper on Lithotrity. On examination, I found that these reports were all that I could have desired. A monthly account is given of the whole of the operations during the last three years. Their accuracy is assured by the circumstantiality with which every case is mentioned, and by the fact that they were not drawn up with a view to the settlement of any particular question in practice. The reporters of these statistics have been under no considerable bias; they have been actuated solely by a desire to promote surgical science. If their returns have a fault, it is certainly not the overstatement of the mortality; for, almost every month, a large number of cases are mentioned as being still under treatment; and although the fatal issue of a few of these is afterwards reported, it is probable that other deaths have happened in consequence of the operation, but at too long a period after it to be known to the reporter or to be recorded by him. It might at first sight appear desirable to have reports for a longer period than three years, but were the period more extended, any such comparison as that we are now making between the results of operations becomes imperfect or impossible by the advancing improvements altering the circumstances.

In the 'Medical Times and Gazette' there are separate statistical reports both of the London and Provincial Hospitals; but I shall restrict my attention to the first, for the following reasons. The principal is, that the hospitals in the provinces are too far apart, and differ from each other in too many circumstances, such as climate, site, and character of the patients frequenting them, to render it possible to form an estimate of their average mortality before etherization was introduced, from the very few published returns of the results of amputations in the Provincial Hospitals at that time. Another reason is, that I am not sure that the administration of chloroform has been so universal in operations in the country as it has been for many years past in the metropolis. In London, on the other hand, there are many large hospitals furnishing the requisite number of facts, and they are all under nearly the same kind of general management, surgical practice, etc. We have authentic returns also of the mortality after amputations in some of the large London Hospitals before ether was introduced, from which, in consequence of the similarity of circumstances just alluded to, we can construct a sufficiently correct estimate of the general mortality for comparison with the present rate. The following table has been constructed from these returns.

TABLE I.

Showing the Average Mortality after Amputations in the Thigh, Leg, and Arm, in four London Hospitals before the Introduction of Chloroform

Hospitals.	Date of Observation.	Reporter.	Primary Amputations.		Secondary Amputations.		Total.	
			Cases.	Deaths	Cases.	Deaths	Cases.	Deaths
University College...	1835—40	Mr. Potter.	8	3	50	7	58	10
St. Thomas's.........	1842—47	Mr. Smith.	20	7	29	6	49	13
University College...	1841—46	Mr. Cadge.	7	4	38	10	45	14
Bartholomew's.......	1846	Mr. Haig.	8	1	14	3	22	4
							174	41

The great diversity which appears in the above table between the two equal periods of observation at University College Hospital, is a striking illustration of what has been termed a run of good or bad luck in the practice of the same surgeon, for Mr. Liston was the principal operator at the hospital during both periods; and it shows, also, how unsafe it would be, unless for a very long period, to rely on any particular hospital as a standard. The return of deaths from amputations at St. Thomas's is heavy, and I might have been justified in rejecting it as being of too private a nature to have the requisite authority; but, in order to prevent any cavil, or appearance of selection, it is retained; and, for the same reason, I have omitted the only other return of amputations which I have been able to find, as respects the London hospitals: objection may be made to it, because the mortality is much below the usual average. This return is from Guy's Hospital, and is mentioned by Dr. Fenwick in his elaborate paper on the statistics of amputation, in the 'Edin. Jour. of Med. Science' for 1847. The period of observation is from 1843 to 1845; the cases are 36, and the deaths 4, or at the rate of 11 per cent. Were this return added to the others in the table, it would reduce the average of the London Mortality to less than 20 per cent., or one fatal result in five amputations.

The present mortality of the London Hospitals is shown by the following tables, into which the several returns in the 'Med. Times and Gazette' have been condensed.

TABLE II.

Showing the Mortality from Amputation of the Thigh, Leg, and Arm, performed under Chloroform in the London Hospitals during Eighteen Months, from June, 1855, to June, 1856, inclusive.

Hospitals.	Primary Amputations.		Secondary Amputations.		Total.	
	Cases.	Deaths	Cases.	Deaths	Cases.	Deaths
St. Bartholomew's	1	..	23	7	24	7
St. Thomas's	4	3	12	3	16	6
Guy's	15	10	34	3	49	13
London	11	2	13	4	24	6
St. George's	6	3	15	5	21	8
University College	3	2	14	3	17	5
King's College	1	1	8	3	9	4
Middlesex	1	1	5	2	6	3
St. Mary's	5	3	12	3	17	6
Westminster	..	..	2	..	2	..
Charing-Cross	1	1	9	2	10	3
Metropolitan Free	..	..	2	..	2	..
Hospital for Sick Children	..	..	1	..	1	..
Seamen's	..	..	5	..	5	..
Marylebone Infirmary	..	..	1	..	1	..
Total	48	26	156	35	204	61

TABLE III.

Showing the Mortality from Amputation of the Thigh, Leg, and Arm, performed under Chloroform in the London Hospitals, during Three Years, from July, 1853, to June, 1856.

	Number of Cases.	Number of Deaths.
First Year	144	57
Second Year	150	50
Third Year	136	41
Total	430	148

It appears by comparing these with the foregoing table, that the mortality in the London hospitals has increased since the introduction of etherization from 21 to 34 per cent., or to vary the expression, instead of amputation being fatal in a less proportion than 1 in 4 of those operated upon, it now proves fatal in 1 in 3. Is not so enormous a sacrifice of life too high a price to be paid for anæsthesia, even granting that this cannot be otherwise obtained with perfect safety? Is life to be held as nothing when compared to pain?—*Med. Times and Gaz., Braithwaite's Retrosp.*

ART. V.—*Medication of the Respiratory Passages.* (Académie de Médecine, Paris, August 25, 1857.) Translated by JAMES JONES, M. D.

DR. TROUSSEAU read a report on a memoir of Dr. Loiseau entitled: *A simple and easy process whereby to penetrate into the respiratory passages in order to cauterize them,* to extract false membranes, to dilate the glottis, and to introduce all the pulverulent or liquid substances useful in the treatment of croup, as a substitute for tracheotomy when not acceptable.

The reporter stated that the number of cures obtained through tracheotomy, had removed in late years the species of interdiction which was laid on that operation. Nevertheless, it did not prevail among the mass of physicians, and is only practised by a small number. The majority discountenance it either on account of its difficulty, or the insufficient proof of its utility.

After having seen many fatal cases of croup in which tracheotomy, although indicated, was not performed, Dr. Loiseau has conceived certain instruments and a practical method for penetrating into the larynx as we do into the pharynx. This invention dates from the year 1840.

Dr. Green, of New York, had already suggested to reach the interior of the larynx by a stiff whalebone with a curve terminated by a small sponge, of which the introduction was facilitated by a tongue-depresser, which in his hands was a good instrument. In form a large spatula, concave beneath, with a horizontal part for the tongue and the handle at a right angle, it can be held without masking the interior of the mouth and thus completely exposes the epiglottis. Nevertheless, it is very difficult to penetrate between the aryteno-epiglottic folds with the end of the whalebone, by reason of their spasmodic contraction, and even on the dead body we succeed only one time in four.

The process of Loiseau is more simple and it is infallible. He protects the base of the left forefinger by a metallic ring of about an inch in height, and introduces it rapidly and far back into the mouth, so that the ring is placed between the molar teeth and holds the jaws open. With the free extremity of the finger at the same time that he depresses the tongue, he seizes the epiglottis, raises it, and shoves the pulp of the index between the folds. Nothing is then easier than to slide a laryngeal tube along the finger, which tube is no other than Chaussier's. The escape of air from the end of the tube proves its entrance into the larynx. It only remains then to apply by means of this tube as a conductor, either the nitrate of silver or any other substance contained in a little cavity in the side of a flexible metallic rod.

In substituting the forceps for the laryngeal tube, we can by a similar process extract foreign bodies which have slipped into the air passages.

In May, 1839, Dieffenbach having used the same method, employed in the identical style, in a case of croup, to him belongs the priority. The reporter believes that Loiseau was ignorant of this fact, which, not having been published, only came by accident to the knowledge of the committee.

In another part of his memoir, the author prefers the employment of tannin in membranous angina to the exclusion of cauterization, which treatment has met with uniform success in *many hundred cases* observed by himself. Dr. Trousseau having recalled to mind that Areteus had already boasted of gall-nuts and tannin in the Egyptian and Syrian ulcers, which nothing but diptheritis demanded, if in some of his cases, Loiseau had not confounded membranous angina with that disease. He had seen Loiseau's practice succeed, but could not consent to abandon caustics.

As to Loiseau's operation, recommended previonsly by Reybaud—which consists in leaving a canula permanently in the glottis—he condemns it as barbarous and impracticable.

In conclusion, he thinks that the method of catheterizing the larynx in this memoir of Loiseau, is a good substitute for tracheotomy, and ought in all cases to be used before this operation. He proposed, therefore, to thank the author and to publish his work.—*L'Union Médicale.*

ART. VI.—*A Summary of Marshall Hall's views on Apnœa or Asphyxia:* Prepared by STANFORD CHAILLÉ, M. D.

AMONG the many contributions of the late Marshall Hall to medical science, none have excited so universal attention in the past eighteen months as his "Ready Method" of treating apnœa. He claims for it the merit of being founded in physiological reasoning and experimental facts, supported alike by theory and by practice, and of carrying with it the invaluable stamp of common sense. Many respectable members of our profession in his country, have bestowed on him unwonted praise for this discovery, and scarce a month elapses, that successful cases of recovery by his method are not reported closing with a tribute to his genius. His rules, and his views in support of them deserve attention from the importance of the subject, from the ability of both the proposer and his arguments, and from the extraordinary success reported to have attended their adoption.

His rules in cases of suspended respiration from drowning are as follows:

1. Treat the patient instantly on the spot, in the open air, exposing the face and chest to the breeze, unless the weather is too cold.

2. Place the patient on the face, with one wrist under the forehead.

3. If there be breathing, wait and watch; if there be none, turn the patient instantly on his side and excite the nostrils with hartshorn, dilute pure ammonia or snuff, the fauces with a feather, and the face by dashing cold water upon it, having first rubbed it dry and warm.

4. If these means fail, replace the patient on his face, raising and supporting the chest well on some piece of clothing; then turn the body very gently *on the side and a little beyond*, and then briskly on the face, repeating these movements alternately, but efficiently and perseveringly *fifteen* times only in the minute, occasionally varying the side. Whenever the body is made to resume the prone position, *i. e.*, is returned upon the face, equable but efficient pressure should be made on the spine at the back of the chest, which pressure should cease immediately before the body is rotated upon the side. In the meantime rub the limbs *upwards* energetically, with firm, grasping pressure, using handkerchiefs or any convenient clothing.

These last directions constitute what is termed "Postural Respiration," which is the great improvement deemed so efficacious in *imitating*, and thus so all-efficient in *inducing* natural respiration.

His recommendations are supported by the following arguments: In all cases of suspended respiration, the first and great desideratum is air, which can only be supplied by the restoration of respiration. How can this be best effected? Not by supplying an undue proportion of air, nor by exciting the circulation before respiration has taken place. For it is a law of the animal economy, that the number and extent of the respirations and the rapidity of the circulation must constantly maintain a due ratio to each other. If this ratio be broken, one of two events must occur: On the one hand the circulation being unduly augmented, *i. e.*, in disproportion to the respiration, or the respiration being unduly suppressed, carbonic acid would not be eliminated in proportion to its formation, and the patient thus be destroyed, as in all cases of death by apnœa. For the lungs supply the system with oxygen, which by the arterial blood is conveyed to every part of the body, where by the processes of nutrition, it supports the combustion of the tissues. It is by this combustion that animal heat is evolved, and the oxygen converted into carbonic acid. This blood-poison is conveyed from thence by the venous blood to the lungs, which are both the ventilator and the chimney of the general system. Now when this chimney is prevented from performing its office, the result is suffocation.

On the other hand, if respiration were *augmented* disproportionately to the circulation, the temperature would be lowered, and the patient might die of *refrigeration*. For respiration is a cooling process, expired air having a higher temperature than inspired air, caloric must be given off by the pulmonary blood. In an uninterrupted healthy process of respiration and circulation, the slight degree of heat lost by the absorption of oxygen, is probably counter-balanced by the simultaneous escape of carbonic acid, the one losing, the other assuming the form of gas; so that the resultant temperature may be unchanged. But if by any means of artificial respiration, oxygen is supplied without a corresponding loss of carbonic acid, the temperature will be constantly diminished, and death be produced thereby. This result has been actually effected upon animals by experiments with artificial respiration.

Hence it may be laid down as physiological laws, that "every means of augmenting the circulation, without simultaneous respiration, only augments the formation of the carbonic acid blood-poison, and destroys the patient;" and that "undue artificial respiration cools and destroys; the balance of temperature is lost."

Now what are the means by which air may not only be supplied, but supplied beneficially, proportionately to the circulation? By clearing the throat; by *exciting* respiration; by promoting circulation and warmth; and by *inducing inspiration.*

Before considering the measures to be adopted to accomplish these objects, it is well to divide apnœa into four stages. First, when the breathing is not quite extinct; second, when the breathing has ceased, but may be excited; third, when breathing has ceased, and cannot be excited, but may be imitated and thus induced; fourth, when the circulation has entirely ceased, in which case the dependent respiration can never be restored by any means.

In the first and second stages, it suffices to clear the throat, by placing the patient on the face with one wrist under the forehead, and to excite the trifacial and cutaneous nerves, the external excitors of respiration, by exposing the face and chest to the breeze; by dashing cold water upon them, by tickling the fauces with a feather, and by applying hartshorn, dilute pure ammonia, or snuff to the nostrils. In the third age it is necessary, the former measures having failed, to imitate breathing by "postural respiration;" to promote circulation and warmth by rubbing the limbs upwards; and to induce inspiration by slapping the surface of the body briskly with the hand, by dashing cold water on the surface, or plunging the body alternately and rapidly from a cold into a hot bath, the temperatures of which should be for the former 50°–60° Fahr., for the latter about 100° Fahr.

As to the means recommended for clearing the throat, Dr. H., contends that in the supine or any position except on or towards the face, the throat is apt to be obstructed by the falling back of the tongue and epiglottis, or by the accumulation of fluids already in the mouth, or regurgitated from the stomach; and these fluids may be fatally inhaled into the windpipe, particularly when inspiration is mechanically effected, thus inducing a second and fatal suffocation. That these results may occur in cases where all muscular and nervous energy has ceased, or is in abeyance, may be judged from the fact, that when a dead body is placed in the supine position, the tongue falls backwards, or may be easily forced or drawn backwards by artificial methods of respiration, and the rima glottidis is closed.

In regard to postural respiration, the superiority of alternate pronation and rotation, with pressure on the spine, over supination with pressure on the thorax and ribs, as heretofore adopted, can be easily demonstrated in the dead-house. When the body is placed on the face, the thorax and abdomen are compressed by the weight of the body, and this force being increased by efficient pressure on the spine at the posterior part of the thorax, will induce *expiration*, and if the body be now gently turned on the side, through rather more than a quarter of a circle, the abdomen and thorax being relieved of the weight of the body, and the pressure on the spine desisted from before rotation is begun, effectual *inspiration* will take place. While these movements to induce respiration are in progress, circulation and warmth may be promoted, (which without them would prove injurious) by rubbing all the limbs and trunk upwards in the course of the veins, which is the best means not only of elevating the temperature of the body, but also of accelerating the venous circulation, by which the carbonic acid poison is conveyed to the lungs, where by the respiration now in progress, it may be eliminated from the system and the patient saved.

In exciting respiration the inhalation of dilute pure ammonia may be very serviceable, as besides its stimulating qualities, it has decided power in neutralizing carbonic acid, as proved by the following experiment: A mouse placed in five ounces of atmospheric air, died in forty minutes. Another placed in the same quantity of air, into which pure ammoniacal gas was diffused, survived ninety minutes. "The difference between these two experiments is, that of the carbonic acid blood-poison retained unchanged and exhaled or neutralized."

Upon the rationale of the warm bath Dr. H. says, that as warmth is not only a stimulus, but also an elevator of temperature, which is so much lowered in the asphyxiated, to submerge a patient in a warm bath would seem the deduction of common sense. But it must be remembered, that if circulation and warmth (the two being inseparably connected) be increased disproportionately to respiration, carbonic acid is retained, and the patient thus destroyed. Further, if there be one fact better established in physiology than another, "it is that an animal bears the suspension of respiration, in proportion not to the warmth, but within physiological limits, (the lower limit being about 60° Fahr.) to the lowness of the temperature; thus in cases of suspended respiration, a *low* temperature conduces to the protraction of life, whilst a higher temperature destroys it."

By experiment we may learn that coolness is more favorable to life in the asphyxiated from submersion than warmth, by the fact that an animal deprived of respiration by drowning lives longer in cool than warm water. If a kitten be thrown into cold water, and then drowned in warm water, it does not become asphyxiated so soon as it would if drowned in the same warm water, the temperature of its body not having been lowered by a previous cold bath. Dogs thrown into the celebrated *Grotto del Cane* become asphyxiated, but to restore them, a warm bath is not resorted to, but they are plunged into the adjoining "*lago Aguano*" and taken out resuscitated. For further proof that animals bear the absence of respiration in proportion to their coolness, it is well known that Hybernant and Batrachian animals can scarcely be drowned at all.

Dr. H. objects then to the warm bath, because if it has any effect, it is to accelerate the circulation, thereby increasing the formation of carbonic acid, which is fatal when there is no respiration to eliminate it; because the uniform temperature of the warm bath excludes the excitation of the cutaneous respiratory nerves by the alternate application of heat and cold; because postural respiration is prevented, and friction of the limbs upwards, which is the most effectual means of promoting circulation and warmth, is interfered with; and because time is lost in preparing and carrying the patient to it, and the mind diverted from the really essential remedies. Therefore experiment and theory alike prove it is both positively and negatively injurious, and that it should never be resorted to, until respiration is fully reëstablished.

To all blowing or forcing apparatus for artificial respiration, he objects on the grounds, that they may injure the delicate tissues of the lungs; that they may force any liquids accumulated in the fauces, into the trachea, and thus suffocate the patient; that even when efficient, they supply air disproportionately to the circulation; that they are not as effectual as postural respiration, and that their application involves loss of time.

The same measures are recommended in the asphyxia of new-born children, care being taken to remove the viscid mucus from the mouth and nostrils. "The new-born infant is a creature of high irritability and low stimulus, of the lowest respiration, that, so to speak, of the fish tribes, the placenta representing the bronchiæ, the foramen ovale and ductus arteriosus are still open, both events greatly calculated to protract life in cases of apnœa; therefore our efforts should be more persevering, and the necessary measures continued, or renewed from time to time, even for hours, for the embers of life may not be entirely extinct."

Dr. Weed whilst lauding Dr. Hall, writes, that he, disgusted with all the old methods of resuscitating the asphyxiated new-born infant, long since resorted to measures similar in every essential particular to Dr. Hall's; and Dr. Corket reports that like measures have been in use in the highlands of Scotland from time immemorial. There, however, whisky is used to rub the face, neck and chest with, instead of sprinkling them with cold water, which he contends is preferable, "since whisky produces a greater amount of cold, and by its evaporation keeps it up longer than water; it is more stimulating to the extremities of the nerves, and more powerful in producing reflex motor action, and so establishing a function so essential to life as respiration."

Dr. Hall recommends his method also, in those cases where death is threatened by chloroform, by narcotic poisons, and by strychnine; observing that in all these cases we have not the simple apnœa alone to contend with, but also the elimination of the poison from the system.

More than twenty new-born infants, a smaller number of the drowned, and several cases of threatened death by chloroform have been already reported, as having been saved by "Marshall Hall's Ready Method," and in many of these cases all the measures heretofore in use, had been previously tried without avail.

Art. VII.—*Yellow Jessamine.* (*Gelseminum Sempervirens.*)

"A planter of Mississippi, while laboring under a severe attack of bilious fever, which had not yielded to the remedies used, sent a servant into his garden to procure a root, and prepare an infusion of it for him to drink. The servant, by mistake, collected the root of the Yellow Jessamine, made an infusion of it, and gave it to his master to drink. Soon after swallowing some of it, the planter lost his muscular power, so as to be unable to move a limb or to raise his eyelids; while he could hear and feel, and exercise his usual faculties as well as in health. His friends became much alarmed at his great prostration; but after some hours he recovered his muscular powers, and was highly pleased to find himself free from fever. He soon learned from his servant what plant it was from which he obtained the roots; and trying its effects upon the people of his own plantation, and those of his neighbors, he ascertained that he had a valuable remedy for fevers. Thus was a new remedy introduced to the world by pure accident."

In fever it is extensively used by the Thompsonians, and is the active ingredient in several quack medicines, as the "Electrical Febrifuge," "Speed's Fever Tonic," "Mississippi River Tonic," etc.; by many physicians experienced in its use, it is considered little inferior to quinine.

While various virtues are ascribed to it by many, all are agreed upon its sedative and narcotic properties. As a sedative, it is deemed superior to either digitalis or veratrum viride, and although not so powerful as the latter, it is yet more safe and manageable, and oftentimes more applicable from the fact that it neither causes nausea, nor acts on the bowels. It acts chiefly upon the sensory ganglia, spinal cord, and voluntary muscles, leaving entirely unaffected the intellectual faculties. It reduces the circulation and frequency of the respirations, promotes perspiration and the secretions generally, and while it relaxes wonderfully all the muscles, it relieves by its action on the nerves of the general system all sense of pain. "Under its influence restlessness is soon succeeded by calm repose, and the excited, frequent pulse, tempers down to tranquillity. These favorable impressions must be secured however by a frequent repetition of the dose, as its effects are not very durable, wearing off in two or three hours." From a full dose, intoxication, languor, dizziness, double vision, and inability to raise the eyelids, result; from an overdose, complete muscular prostration and death.

Dr. J. A. Mayes to whom these extracts are due, says, "I esteem it a most valuable adjuvant to other treatment, in all cases where high arterial action exists, in which it is desirable to lessen the frequency of the pulse, and to calm excitement, and where, as in the case of injuries, it is desirable to lessen the irritability of the nervous system; also in that troublesome hysterical exaltation of the nervous sensibilities, so often met with in enervated females, its value cannot be too highly estimated.

In short, it is a specific for no particular disease, but an admirable adjuvant in the treatment of nearly all, bringing about in the system a state of repose favorable for obtaining the full action of other and more radical treatment."

The root contains a dangerous resinoid principle readily soluble in strong alcohol, but not in dilute liquor or water, while the sedative properties are fully so.

Dr. Mayes recommends the following formula: "Four ounces of the fresh root, chipped small, to one pint of dilute alcohol; macerate for fourteen days." The dose of this tincture for adults is from twenty to fifty drops, repeated as often as required.

Dr. J. Douglas regards it as almost a specific in gonorrhœa. He has found it a most uniform, speedy and permanent cure in all and numerous cases which he has treated. He gives a tablespoonful night and morning, of a tincture made by placing a handful of the root in a bottle of whisky; after a few doses its narcotizing effects are strongly marked, and the beneficial results immediate.

The whole of this plant, flowers and root, possess the same medicinal virtues.—*Charleston Med. Jour.* S. C.

Art. VIII.—*On Mercury in Typhoid Fever:* by Dr. Ware.—A paper read before the Abbeville District Medical Society.

There is probably no question more interesting to the medical practitioner of our district, or more practically important, than that which relates to the propriety of using mercury in the treatment of typhoid fever. We are every year becoming more painfully familiar with the ravages of this mysterious, this obstinate form of disease, and yet the opinions entertained as to its pathology are almost as unsettled as ever, and the treatment of it as empirical as when it first visited our latitude. True, we have witnessed, time and again, all the symptoms that manifest themselves during the progress of the disease, in all the various forms that it assumes, and we can unhesitatingly trace these symptoms to the different tissues, of the disordered states of which they are significant. We are fully acquainted, too, with all the morbid appearances, all the appreciable lesions revealed by *post-mortem* dissections, and still we are forced to admit, that our positive knowledge stops short at secondary links in the chain of causes; that we are yet ignorant of the real nature of the primary impression or lesion, from which results the pathological conditions manifested by the phenomena developed during progress of the disease, and which causes these pathological conditions to resist the influence of remedies usually found efficient to overcome diseased states occurring in other forms of fever, but affecting the same organs and tissues, and giving rise to the same, or apparently the same, train of symptoms. Often are we forced to watch a case, week after week, unable to check its progress, trying first one plan of treatment and then another, without seeing any decidedly beneficial effect from any; and in the end we are totally unprepared to say, if the case terminates fatally, whether death was the result of the disease or of the means used to subdue it; or, if the patient recover, whether or not any thing we did, contributed to his cure. Such is the uncertain state of our knowledge, such the humiliating admissions which honesty forces us to make; and it becomes us to examine ridgidly and candidly every plan of treatment proposed, and to submit every remedy to the test of a most scrutinizing investigation, before admitting its claims.

Typhoid fever is, according to the best evidences of its true pathology, essentially a disease of irritation, and this irritation, whatever part, tissue or organ, may be its primary seat, results in general irritability of the system, or in some local inflammation, or both; and all are agreed as to the grand, leading indication, viz.: to subdue irritation, and support the system under its wasting influence. It is our object to prove, that this, the most important indication, and the one to which all others are but secondary, can not be met by the use of mercury, and that such use is not only unphilosophical, but hazardous: unphilosophical, because it constitutes an attempt to remove a cause by relieving an effect, and hazardous, because it involves an expenditure of vital energy under which the patient may sink, and which can, under no circumstances, contribute to his cure.

Settled opinions, it has been well said, are difficult outposts to carry, though nature herself be battering at the walls; and the tenacity with which many cling to the mercurial treatment, fully exemplifies the truth of the assertion. Accustomed to see all evidences of disordered states of the digestive organs, as occurring in fevers of miasmatic origin, yield to the influence of mercury, it was not at all surprising to find physicians slow to acknowledge the utter inefficacy of this drug, when used in the treatment of a disease having so many symptoms in common with that one, in which it is wont to exhibit the most beautiful display of its powers. We may have, during the progress of a case of remittent miasmatic fever, a congestion or an inflammation of the liver, a torpor or an excessive action of this organ, and any or all of these conditions may be relieved by the judicious administration of calomel. In typhoid fever, the liver becomes congested and inactive, and mercury fails to remove the disorder. Remittent fever, it is admitted on all hands, has its proximate cause in a nervous centre, and with equal unanimity it is agreed that typhoid fever has its primary seat in *some* portion of the nervous system. Then, why these different results from the same course of treatment, when instituted in two diseases having their proximate causes in the same system of organs, and whose more remote consequences, as displayed in their effects upon the liver and its functions, are apparently the same? May we not, upon true inductive principles, answer, that the two diseases are, in their nature, essentially different, that they are generated by circumstances and agencies totally dissimilar, and that they commence their attacks by making impressions having no *real* analogy? And may we not, with equal propriety, contend, that, in reference to the liver, in the one case, the disorder is the result of causes overpowering the *existing* energies of that organ; in the other, of such as diminish the native force of those energies? That, in the one case, functional derangement is the result of increased action; in the other, of diminished vitality. In remittent fever, the action of the liver is disordered or suspended, because the channels through which it acts are obstructed, its machinery clogged: in typhoid fever, this viscus exhibits evidences of imperfect or disordered action, as the result of a diminution of its motor power; and this diminution is caused, not by continued resistance to the *exercise* of that power, but by the failure of its source. Hence it is that mercurial purgation, in remittent fever, increases the strength of the patient, and contributes to his comfort, by relieving the surcharged vessels of the portal system, and thus allowing the liver the free exercise of its powers, which had been held in check, not obstructed; whilst the same agency, in typhoid fever, increases debility and aggravates existing symptoms, by worrying an organ rendered incapable of being aroused to healthful action, in consequence of its diminished supply of nervous influence.

Again, diarrhœa frequently occurs as a complication of remittent fever, and no symptom is more frequently present in typhoid. And yet, how different the diseased states upon which depend the symptom, as they occur in these two forms of fever, and how strikingly different the means required for the relief of each. The same organs are affected in both instances, but, if I may be allowed the expression, from different directions. In remittent fever, the diarrhœa occurs in consequence of engorgement of the liver, inducing a congestion in the vessels ramifying upon the mucous lining of the intestines, or from the presence of acrid secretions, or of indigestible substances, or from all these causes combined; and we have, accompanying the profuse alvine discharges, a furred tongue with red edges, (probably dry) and a tumefied condition of the abdomen, with great tenderness on pressure. The tumefaction of the abdomen is removed, and its tenderness relieved, by blistering its surface, and under the continued use of calomel and opiates, the diarrhœa is checked, and the discharges gradually assume a healthy appearance. Here, too, the cause of deranged action is distant from the source of power, and coming within the reach of calomel, the organs are restored to the proper exercise of their functions. But in typhoid fever, the diarrhœa is the result of a diseased condition of the mucous follicles of the intestines; which diseased condition is induced by the failure of healthful innervation, entirely independent of the portal engorgement, vitiated secretions, or indigestible matter; and though we have, as before, a tympanitic condition of the abdomen, yet there is very little tenderness upon pressure, a blister fails to relieve, and the administration of calomel is not followed by a change in the character of the discharges, approaching more and more nearly the healthy standard, because the seat of the difficulty is beyond the reach of this medicine, and located in a system of organs over which it exerts no *direct* controlling influence. True, if opium be combined with calomel in such quantities as to prevent its acting upon the bowels *at all*, the first discharges that occur may be consistent, and they will probably, exhibit some trace of biliary secretion; but, if allowed to continue, they invariably become watery again, and the scanty admixture of bile gives to them a dirty, dingy, brick-dust color, strikingly different from that appearance so characteristic of stools induced by the specific action of mercury. Nor is the patient at all benefitted by this purgation, but on the contrary, he is invariably left in a more debilitated condition, and frequently with all his symptoms manifestly aggravated. Another consideration, too, renders this practice eminently unsafe; for the calomel, if used at all, must necessarily be given in small and repeated portions, and combined with an opiate: thus ptyalism may be induced, and if this occur, *cancrum oris* will be likely to supervene, in consequence of the putrescent condition of the fluids, always present in typhoid fever. If this be true, (and a painful experience convinces me that it is,) is not the use of mercury, as a means of relieving the disordered condition of the bowels generally incident to this disease, both unphilosophical and hazardous? And if the views that we have expressed as to the difference in the pathological conditions, upon which depend the symptoms that we have investigated, and which occur both in miasmatic and typhoid fevers, be correct, there is, certainly, no analogy between the two forms of disease, and any plan of treatment predicated upon the supposed existence of such analogy, is in violation of the plainest principles of medical philosophy.

But the impropriety of the use of mercurials is not only proved positively, by the fact, that the pathology of the disease under consideration is essentially different from that of the diseases in which mercurials manifest their happiest effects, but also, by implication, from the efficacy of remedies of a totally different nature, viz.: stimulants and anodynes. These allay irritation, check diarrhœa, subdue delirium, overcome watchfulness, promote sleep, equalize temperature, support the powers of life, prevent the disease from expending its force upon any one vital organ, and, in a vast majority of cases when judiciously administered, conduct it to a favorable termination. And if in the assemblage of symptoms, constituting typhoid fever, these desirable results can be accomplished by the use of mercury, its properties are much more varied than we have been accustomed to regard them, and after all the time and study that have been devoted to the investigation of its physiological effects and uses, we are still unprepared to assign it its proper place in the classification of the materia medica.—*Transactions South Carolina Medical Association.*

REVIEWS.

Rev. I.—*Traité de Géographie et de Statistique Médicales et des Maladies Endémiques, etc.* A Treatise on Medical Geography and Statistics, and on Endemic diseases, etc.: by Dr. J. Ch. Boudin, 2 vols., 8vo., Paris, 1857.

This voluminous and comprehensive production is the crowning effort of a prolific author, who has already given to the medical world an extraordinary number of monographs dedicated principally to specialities allied to the subjects of the above title. He has divided the treatise into four sections: I. Medical Meteorology and Geology. II. Statistics of population and mortality. III. Geographical distribution of diseases. IV. Comparative pathology of the human race.

Anticipating in the introduction several interesting topics more elaborately discussed in their proper chapters, the author commences his argument in commendation of the important subjects to be studied. He treats of the supposed adaptability of the human race to every variety of climate, gives several examples from familiar statistics indicative of the comparative predisposition of the negro to mental alienation in a progressive ratio with an increase of northern latitude in the different States of the American Union. He also invites attention to the narrow limits within which it is possible for the negro to propagate, declaring that his race would soon be extinct in Egypt and in Northern Africa, exactly as it is constantly melting away in the British West Indies, where, according to the author's tables and the authority of Tulloch, at the present rate of decrease, there will not be an individual remaining by the end of a century. He draws in strong contrast the miraculous adaptability of the Jew to all climates, for there are none under which he does not thrive and multiply.

We append his remarks introductory to comparative pathology: "The diseases of the human species are neither identical in time, nor in space. History tells us of a certain number very prevalent in ancient times, in our days almost unknown, while affections then entirely unnoticed, produce at the present time the most terrible ravages. It is to this law that Pliny, the naturalist, alluded eighteen centuries ago, when he said "that it appeared wonderful that while some diseases had entirely disappeared from among us, others should still remain."

In relation to space, "diseases" says he, "have their *habitats*, their *stations*, their geographical limits. In Europe cholera has a northern limit of 64° latitude, and a southern of 21°. In the old world malarious fevers do not prevail beyond the Hebrides and the north of Scotland, while in the southern hemisphere their northern limit is an isothermal line of 57° Fahrenheit. Yellow fever has never passed beyond the 48th degree of northern, nor the 27th degree of southern latitude.

The predisposition of different races to particular diseases is very remarkable. In reference to malarious diseases, if we make the negro unity, we thus tabulate the degrees of susceptibility: Sepoy, 4; Malay, 6; natives of Ceylon, 7; English, 32.

The facts adduced by Boudin to establish that sea voyages and a sailor's profession are valuable agents for the alleviation and prevention of phthisis pulmonalis; that typhus always commences in winter and terminates in the summer in strong contrast with the yellow fever; that phthisis is more fatal under certain circumstances in tropical than in northern latitudes are all worthy of examination. We relinquish them unwillingly for the present, with all the subjects of geology, physical geography, climatology, thunder and lightning statistics contained in the first volume, for several specialities introduced in the second.

It is impossible to read in this work the complete history of the military occupation and attempted colonization of Algeria, without perceiving how unfavorably, and, indeed, hopelessly they have been regarded by the distinguished generals who have reported on the mortality in the army, and by the eminent physicians who have studied them in every aspect. The annual decay of the army by disease alone since 1837 has fluctuated between 38.40 and 140.08 in a thousand of picked men, not probably enumerating those who returned to die in the hospitals at home. Among the colonists proper, the average annual mortality for a series of years has exceeded sixty in a thousand, which as is well remarked by the author, might be comparatively estimated even higher if we recollect that there are no aged persons, and that many who are in bad health return to France to die among their friends. Compared with the number of births, that of the deaths is frightfully preponderant among the French population, while among their offspring with the native women the disproportion is even greater. This does not complete the gloomy picture. The colonists who escape death are so shattered, so prostrated in physical and mental energy, that they are incapable of advancing any important part of the objects for which this immigration has been so liberally encouraged. The cultivation of the soil cannot be reasonably expected of such subjects, and if, as Boudin says, a greater proportion had been thus employed the mortality and demoralization would have been largely increased.

Among the Moors or the Mussulman population, the statistics establish a mortality greater even than that of the Frenchman. In seven years they record 23,000 deaths to 9,000 births.

The prospect of negro colonization remains yet to be stated as the most unpromising of all. "The children of negro parents," says Vital, "die more rapidly than those of the European. Of one hundred born annually, it is barely possible that two can attain the age of adolescence."

Among the remedies suggested for the unsuccessful issue of Algerian colonization the author discusses the proposition frequently urged, to cross the races by amalgamation with the native women. This scientific recommendation, which has been most faithfully observed in every French colony without even the encouragement of the government, is not sustained by the mortality reports. It does appear that the colonization of Algeria by France, is not more promising than her efforts for a similar object in other parts of the world.

While we unhesitatingly avow entire confidence in the value and fidelity of the author's statements relative to his own country and to its colonies, truth compels us to declare that his book is not reliable as a work of reference on the domestic institutions, mortality statistics, and comparative pathology of others. The whole article on the peculiarities of the climate and of the people of the United States, is borrowed from the writings of a traveling French professor, M. Desor. This peripatetic savant has given a graphic account of the anthropological American status, in which, starting on the old position of Buffon that the whole animal creation degenerated in America, he finds that the population are not only entirely deficient in embonpoint, but equally so in muscular and in glandular development, which last abnormity he philanthropically italicises, "*merits the serious attention of the physiologist, as directly compromising the future of the American race.*"

It is a matter of just surprise that while by the intimate personal and business relations sustained between the citizens of France and those of Louisiana, and by the official statistics decennially published, the author might readily procure proper information on the subject of negro slavery in America, he should reproduce the contemptible article contained in the Dictionary of Political Economy, issued at Paris in 1852. I condense the account with little alteration in the language:

"The slave States are divided into the breeding and the consuming. In the former, every attention is paid to increase their number and to improve their quality, so that a premium is paid for the production of mulattoes, who are the most prized. On the part of the breeders, fecundity is regarded as a virtue, sterility as a crime. They flog barren negresses and the mothers of children that die. For the benefit of a market, these Virginia and Carolina breeders are the strongest advocates for annexation and the hottest opponents of importation from Africa. Trading in slaves is not less profitable than breeding, and the most eminent men in the United States, magistrates and clergymen have no scruple in thus investing their capital. President Jackson purchased cargoes of slaves in the north to resell them in the south. Infants are generally separated from their mothers because they have no value in the south; when gangs of slaves are purchased, the State prisons always serve as their depots. The average life of an imported slave in the south does not appear to exceed five years, and from this cause, the annual loss on a plantation is 2½ per cent. The excessive labor is an obstacle to reproduction, and slavery would rapidly disappear from the consuming States if it was not incessantly renewed from the breeding States. 'Every habitation,' says M. Molinari, 'has its own code of tortures. In one, the disobedient negro wears a collar like a dog, in another his cheeks are branded with a red-hot iron, and in others they break the knee-pans with tourniquets. The most common punishment for runaways is extracting the front teeth,'" etc.

In order to correct the author's statistics for the next edition of this work, we extract the following from the last census of the United States:

"1. The present number of negroes in the United States, to that of those originally imported is as 8 or 10 to 1.

"2. The proportion of the same in the British West Indies is as 2 to 5.

"3. The average annual increase of slaves (in what he calls the consuming States) is 5.43 per cent.

"4. The average loss by death 1.58 per cent."

Although published in a language not familiar to the majority of our readers, this work is apt to be held up hereafter as one of authority. Except in the limited field already acknowledged, we do not hesitate to declare that as a work of reference it is in many particulars unreliable. The statistics of the comparative pathology of different climates, taken from English, French and American army reports, are confessedly important in a military and hygienic point of view. The extraordinary proclivity to phthisis pulmonalis exhibited by garrisons in southern latitudes, when found contrary to the ordinary standard of the same morbid condition among the resident population, is demonstrative, in my opinion, not of a disposition to an increased development of phthisis in the South, but of some great and remarkable error in the quartering, clothing, regimen and general management of soldiers. Pathologically, scurvy and tuberculosis are generally held to be antagonistic—one, long the terror of seamen, has almost disappeared by proper attention to hygienic rules; the other, equally fatal in another great arm of national defense, will doubtless prove amenable to judicious sanitary regulations.

It appears from a careful examination of the mortality statistics lately published, that whereas the total proportion of deaths by phthisis pulmonalis in the English army amounts to a fraction of over five in a thousand men, that in the navy it is represented by less than two in the same number. It is an interesting and important fact that the loss by phthisis on ships of the line and frigates is twice as great as that on sloops of war and steamers. In a letter to Lord Panmure, on the construction of barracks and on the proper management of soldiers, signed by seventeen eminent military surgeons and professors, and published in the Journal of Public Health, for June, 1855, we find that while the mortality among the troops quartered in Great Britain is annually 15 in 1000, that the ratio among the police of London, equally exposed to night duty, is $7\frac{1}{2}$, or exactly one-half of the former. We insist that the whole of the military statistics published in relation to phthisis should be more properly held as an indication for reforms in the service than as evidences of great value for establishing the climatic habits of the disease.

James Jones.

Rev. II.—*Statistical Report on the Sickness and Mortality of the Army of the United States;* compiled from the Records of the Surgeon-General's Office; embracing a period of sixteen years, from January, 1839, to January, 1855: Prepared under the direction of Brevet Brigadier General Thomas Lawson, Surgeon-General United States Army, by Richard H. Coolidge, M. D., Assistant-Surgeon United States Army. Senate, U. S.: Ex. doc., No. 96. Pp. 703, 4to. Washington. 1856.

In 1852, the surgeon-general addressed a circular to the medical officers of the army, requesting them to report the geographical position, physical aspect, geology, flora, fauna, climate, vital statistics of the population, the diseases, etc., at the different army posts, for a period of sixteen years, that is, from Jan., 1839, to Jan., 1855, including statistical details in tabular form of the sickness and mortality of the troops taken from official records. A large quarto, compiled by assistant-surgeon Richard H. Coolidge, M. D., U. S. A., is the result.

The army meteorological register, and the medical statistics of the army, are due chiefly, it is supposed, to the energetic administrative action of Dr. Lawson.

How imperfect soever, in many respects, this latter work may be, owing to its limited data, taken from the dynamical condition of a small army, now on the shores of the Atlantic, then on the Pacific, now in Maine, then in Florida, in New Mexico, on the great lakes, or in the western wilderness, still the facts developed are highly important in illustrating the vital and sanitary history of a particular class, if not conclusive in regard to the climatic influences upon the civil or savage residents of the vast regions and different climates where the military posts are established.

The information derivable from these army reports, is not only very valuable but is difficult to obtain from other reliable sources, not being wholly restricted to vital statistics, but comprehends much concerning the physical features, geology, flora, fauna, climate, and population of different regions, including the Indian tribes.

The surgeon-general, Brevet Brig. Gen. Lawson, and Dr. Coolidge deserve the thanks of their medical compatriots for their laudable efforts to make the national government auxiliary and subservient to the advancement of medical science, not only in the army, but in civil life. Although medical facts and statistics derived from the army represent only a particular and very dynamical class, yet, on the other hand, the army medical officer has some desirable facilities for enforcing such measures as may be necessary for carrying out remedial treatment, and for obtaining exact data and significant results. In civil life, the medical treatment is not only without authority, but is often a compromise between the physician and the patient, or the friends of the latter, not to mention nurses, black, white, and mixed.

The regular army, as now constituted according to law, amounts to 12,698, of which number 1,040 are officers. Of 5,000 recruits enlisted in the years 1850 and 1851, only 1,484 were native Americans! In 1852, the number examined amounted to 16,064; the rejected to 13,338; and the accepted to 2,726. There were rejected for not being able to speak the English language 2,434!—(pp. 626–7.) Foreigners constitute an overwhelming majority of the army, the native force being but 1 in 3.3+.

The official statistics of the war with Mexico, cannot fail to cause an agreeable surprise among those who have formed their opinions from the newspaper accounts of the losses of the American army, in the numerous pitched battles during the glorious campaigns of 1846 and 1847.

The aggregate force of the old army was 15,736, the killed in battle and dying of wounds during the war, twenty-six months, amounted to 792. This loss from battle alone was relatively greater than that of the volunteer force. The total loss from sickness and all other causes amounted to 4,917, while among the volunteers in ten months, in an aggregate force of 73,260, the loss was 20,385, or 27.82 per cent., or 2.78 per cent., monthly, against a monthly loss in the old army of 1.2 per cent. per month, for twenty-six months—a remarkable disparity truly.

The returns of the killed on the field of battle in the regular army in some of the principal battles, as also the aggregates in skirmishes, will be now subjoined: Palo Alto (May 8, 1846,) 5; Resaca de la Palma (May 9, 1846,) 33; Monterey (Sept. 21, 1846,) 55; aggregate including other affairs, 125.

Regulars. 1847. February 22 and 23. Killed at Beuna Vista, 6.

March 9 to 28. Vera Cruz, 7.

April 18 and 19. Cerro Gordo, 40.

August 19 and 20. Contreras and Churubusco, 106.

September 8. El Molino del Rey, 124.

September 12 to 14. Chapultepec, 104.

Total killed in 1847 in the regular forces, 556.

1847. Volunteers. Killed on the field of battle among the volunteer forces: at Beuna Vista, 259; Cerro Gordo, 24; Contreras and Churubusco, 27; Chapultepec, 34. Aggregate for the year, 399.

Aggregate for 1846, 75; grand total, 474, for the campaigns of both years.

The year 1847 gives for the principal battles, and for all the skirmishes, both by regulars and volunteers, the following results: killed in the regular army 556; among the volunteers 399; amounting for both to 955.

Total killed in battle during the entire war in the regular and volunteer forces, 1044. Total killed and died of wounds, 1549.

At the moment of making these enumerations, a document, dated Sept. 25, 1857, published by Maj. Gen. Pillow, came to hand, in which he asserts that the capture of the city of Mexico alone, cost the blood of 1672 men out of 11,500 soldiers, all told, of the American army; he, himself, a commanding general, having been wounded in, and a witness of these battles.

Memory, however, is not to be trusted in important matters of this kind, when contradicted by official returns of battles made at the time and place of their occurrence.

It was the war with diseases, not with Mexicans, which decimated the American army—a war not with epidemics, but with maladies, which, for the most part, were preventable.

In vain are the arms of war put into the soldier's hands for a long campaign, if the physical comforts be withheld. His chance of dying of an inglorious diarrhœa, dysentery, pleurisy, pneumonia, camp fever, or other disease resulting from privation and exposure, is vastly greater than his chance of a glorious death upon the field of battle. "Somehow or other," said Frederick the Great, "Providence seems to do the most for the best disciplined troops." "I have always noticed," said Napoleon, "that Providence favors the heaviest battalions." Other commanders have advised their soldiers to trust in Providence, but at the same time to keep their powder dry. It might be equally wise to assume that battalions properly clothed, lodged, fed, and provided with the physical comforts and means of transportation, and good physicians, will accomplish most for their country and with the least loss to themselves. The government or their authorized agents are answerable for the majority of the deaths in the army. To prove this, let the secretary of war, the commander-in-chief, and the surgeon-general of the army, or their representatives, study a paper in the July number for 1848, of the N. O. Med. and Surg. Jour., by Dr. Love, surgeon of the 2d regt. Mississippi Rifles. These troops embarking at Vicksburg, Jan. 2d to 6th, reached the muddy battle-field of New Orleans, where, before the end of the month 80 men died in the suburbs of New Orleans, by the war of the elements, cold, rain, the lack of clothing and other physical comforts, all of which were readily attainable in the city, at a moderate expense. Twenty-eight men of this regiment, after having embarked on January 30th, were committed to the deep before the troops landed at the Brasos, making a loss at the outset of 108 men. "The Pennsylvania troops," says Dr. Love, "were encamped on the battle ground at the same time, and appeared to enjoy good health. They were, however, well clothed in wollen goods, etc. We had no reason to believe that there was anything peculiar or poisonous in the atmosphere, etc. * * * * The captain of Company G provided his men with additional blankets, * * * * while the captain of Company I exposed his men; the mortality of one is 9—of the other 24."

The survivors after having reached their destination, lost 59 of their number from disease, making a loss of 167 by disease, to which must be added 134 discharges—a total loss of 301 during six months in one regiment. Leaving, after deducting 50 (transferred or deserted,) only 534 men out of 10 companies!

If the greatest personal compliment consists in imitation, it cannot be the smallest compliment to a book to make the extensive quotations which enrich several articles in the present number of this Journal, to which the reader is referred for important details that need not be repeated in this short notice.

There is one fault or rather omission chargeable against Dr. Coolidge, the able compiler, namely, the work is without an index.

There is a paper, which coming as it does from a medical officer, and being of an exceptionable character, should not be ignored by an independent reviewer, seeing that it has a kind of quasi sanction of the government, as will be seen in the sequel.

Surgeon S. G. I. De Camp's report on the topography and diseases of Fort Columbus, lat. 40° 42′, Governor's Island, harbor of New York, contains the following extraordinary confession of medical faith, namely, "I cannot let the present occasion pass without bearing testimony to the value of the sulphate of quinine, and arsenic, and other remedies of that class, in the treatment of disease, extending to a range far beyond what was once supposed. The intermittent character of disease would seem to be more extensive than some imagine. *I am indebted to Doctor Dickson's Chrono-Thermal System of Medicine for the views which I now entertain upon this subject*, and can speak with confidence of the value of these remedies in rheumatism, asthma, continued fever, and some spasmodic affections in children, and in many cases of an anomalous character, the pathology of which is little understood."—15.

The Dicksonian system from which this report imbibes its knowledge, cannot be considered as having been even virtually endorsed by its acceptance and publication, as neither the surgeon-general who revised it, nor the U. S. Senate who ordered its publication with other documents, deserves criticism in this behalf. Indeed the surgeon-general in his circular to the medical officers says, "as it is proposed to publish each individual essay under the name of the gentleman who draws it up, all facts, statements and conclusions will rest upon the responsibility of the officer making the report."

As this report is an official one it may be proper to glance at the precious system which it endorses. The status of this system is indicated by its title, namely, "Chrono-Thermal System of Medicine; with the Fallacies of the Faculty; People's edition." This apparently semi-official recognition of an utopian system, which is destitute of originality, being only remarkable for its calumnies against the regular faculty and its denunciation of many valuable medicinal agents, nevertheless gulps down arsenic, copperas, blue vitriol and white, tartar emetic, creosote, lunar caustic, and greatest of all, Prussic acid.

In "the People's (3d) edition," Doctor Dickson declares that he has given lunar caustic to 1,000 persons without harm, and with great advantage. The main pathological doctrine of this utopian system is that of universal intermittency; in which category he places jealousy, leucorrhœa, cancer, tumors, miscarriages, teething, etc. "As sure," says he, "as the sun ever shone on this earth parturition in every instance *is an intermittent fever.*" The greatest obstacle to the improvement of medicine is, according to him, the preference given to male over female practitioners. He says, "life is electricity; medicine repulsion or attraction. Peruvian bark is motive power. There is but one disease, fever. Purgatives act through the brain. All medicines cure by their electrical influence solely, being useful only so far as they improve the temperature." He ridicules the stethoscope, derides pathological anatomy, etc.; and equally, with his predecessor, Samuel Thompson, whom he wholly ignores, denounces bloodletting altogether. There is but one true physician, himself! He says, in capitals, "I STAND ALONE!" In New Orleans a few years ago, there was a lunatic who perpetually and loudly proclaimed himself "THE GREAT I AM." His somewhat sublime ravings excited pity, but the pretentious charlatan deserves contempt only.

Everything that is true in chrono-thermalism has been said a thousand times by the regular faculty, and it is a matter to be regretted that a highly respected medical officer of the army should travel out of legitimate medicine for his system of practice, and sanction, in his official report, incoherent dogmas injurious to the profession and the well-being of society.

It is hoped that surgeon-general Lawson and assistant-surgeon Coolidge, have been, or will be invested with the power to consign to the flames, such documents as are injurious to the well-being of society, injurious to science, injurious to the medical profession.

The Reports on the administration of Quinine in large doses, which occupy 53 quarto pages, present neither originality nor numerical precision. Assistant (now surgeon) Charles McCormick, for some years a resident in New Orleans, had as early as 1841, reported in favor of using the sulphate of quinine in intermittent and remittent fevers, even during their paroxysms, in doses of fifteen grains each, sometimes increasing the dose to twenty-five or thirty grains every hour. This able physician has more, perhaps, than any other, contributed to introduce large doses of quinine into the army practice.

Besides the two reports by Dr. McCormick, and two by Dr. Byrne, on quinine, reports have been published in this work upon the same subject, from the pens of surgeons Harney, Satterlee, Wood, Randall, Wright, Bailey, DeLeon, Madison, and Simpson. The reports of these gentlemen must be regarded as selected from a great number: For it appears that reports, in reply to the circular of the surgeon-general concerning quinine in large doses, amouted to fifty-seven, from as many medical officers. But it would be almost as difficult to shorten a straight line as to deduce a numericial rule possessing precision and universality, from data so limited and imperfect, perhaps selected, not to mention the possible omission of desperate cases. The omission of fatal results is a crying evil in the statistics of surgery and clinical medicine.

At present, the limits of this Journal will not permit any investigation into the natural history, meteorology, climates, medical topographics, and predominant diseases of the different regions which these reports illustrate.

BENNET DOWLER.

MISCELLANEA.

I.—*Professor Agassiz.*

Messrs Editors: We beg leave to lay before your readers the following extract of a letter, from one conversant with the facts, touching the forthcoming work of this distinguished gentleman, on the Natural History of our Country, and feel assured that the explanation given will be perfectly satisfactory to those subscribers at the South who have so generously stepped forward to aid his great enterprize; they will always be ready to indulge and to honor the man whose labors are conferring so much honor on our country.

J. C. NOTT, M. D.

"His book, though it does not yet appear, is going on rapidly. The letter press of two volumes is already complete and ready for publication—has been indeed for two months past; but the great difficulty of finding printers capable of executing the plates retards the whole. For a long time the publishers could find but one man who was up to such delicate work—now, by sending abroad, they have, I believe, three, and the work is going on better.

"It has been proposed to send a part to Paris to be executed, but Agassiz was unwilling to change the *national character* of the work—*un-Americanize* it, by allowing a single plate to be printed out of the United States. In this he hopes his subscribers will agree with him.

"He is now engaged, and has been all summer, on the third volume—on the *Medusæ*—and hopes that though the first two volumes have been so unavoidably delayed, the third will follow them quickly, as the proper workmen are now engaged, and the difficulties as to the printing of the plates fully understood. His own labors have really been unceasing from the beginning. More than 650 pages of the text having passed through the press during the last year.

Cambridge, Mass., Sept. 28th, 1857."

II.—*Reägent to discover the very smallest quantity of the Bichloride of Mercury in Calomel, adulterated therewith.* Translated from the *Bulletin Général de Thérapeutique*: By DR. CHAILLÉ.

"THE purity of calomel is so important a point, that we deem it useful to designate to practitioners, a very simple process by which they may assure themselves whether this medicine is exempt or not from corrosive sublimate. The formula of this reägent is as follows: ℞. Potassii iodidi, gr. ij.; aquæ destillatæ, ℨiij. M.

"With a few drops of this liquid make a paste on a small piece of glass with about eight grains of the calomel, to be tested. If the calomel is pure, it will assume a green color; if it contains but a millionth part of the bichloride, red spots will be apparent."

The above test may be relied on. The green color is rather a light yellowish green, and the red spots are so minute as to escape careless observation, when the quantity of bichloride is small. The difference in color between the two pastes is well marked.

III.—*Decomposition of Compounds.*

IN the late meeting of the British Association, a paper was read from Dr. Woods, of Parsonstown, "On the time required by Compounds for Decomposition." The paper first proved experimentally that the intensity of a galvanic battery depended on the rapidity with which the electric current is produced. It then showed, *cæteris paribus*, this rapidity depends on the decomposition which necessarily takes place at one end of the battery, and proved, from the experiments made to demonstrate the above propositions, that all compounds require a certain specific amount of time wherein to decompose. It has been long known that the "forces," such as heat, electricity, etc., brought into play by the molecular changes of matter are definite and imperishable, but the invariable and definite nature of the "time" in which these changes and these forces are produced was not before observed.

IV.—*Vitality of Seeds.*

At the meeting of the British Association for the Advancement of Science, (Dublin, Sept., 1857,) Dr. Daubeny read a paper on the Vitality of Seeds. Experiments had been made on mummy seed, but it was found they had not vitality, and other experiments disproved the common belief regarding the indefinite vitality of certain seeds. The greatest number of seeds lose their vitality in eight years, and forty-three years was the longest period which they were found to retain it.

These observations were confirmed by Dr. Steele, and Mr. Moore, curator of the gardens of the Royal Dublin Society.

V.—*Professional Incomes.*

Mr. Leslie read a paper "On Professional Incomes." He went into a comparison of the profits of the Bar, the Established Church, the Medical Profession, the Army, and the Civil Service, with those shown by the income tax returns to be made in commercial business, and he proved that the professions are, both relatively and absolutely, underpaid, as far as money only is concerned, but "honor," as Adam Smith says, "forms part of the reward of all honorable professions." Mr. Leslie then showed how a new class of honorable and scientific professions had lately sprung up on the continent, and that the same thing was both necessary and possible in this country. Of both these points he gave proofs and observed that we should endeavor to repair our shortcomings by giving, in case of those who would soon succeed us, honor where honor is due, even if the laws of custom and heraldry did not sanction our applause. "Its echoes," said Mr. Leslie, "will be heard when these walls have grown old around youthful genius, instructed for wider and more beneficient aims than ever their enlightened founder can foresee."—(*Brit. Assoc.*)

[Prof. Leslie read another paper on *Competition at the Bar*, an analysis of which may interest some of the readers of the N. O. Med. and Surg. Jour., who may be deliberating whether to choose that profession for their sons. It is believed that the number of lawyers, especially of the non-practising class, is in proporrion to the population and its wants much greater in the United States than in the British empire; and, also, that the number of this profession, especially the number not finding employment, in the United States, is proportionally much higher than that of the medical profession. In New Orleans the number of lawyers greatly exceed that of the medical faculty; a few of the former doubtlessly receive larger emoluments than any of the latter, while, upon the whole, the number of non-practising lawyers is proportionally much greater than that of the non-employed portion of the medical profession. Hence, if physic pays badly, the law pays worse, with rare exceptions; the probabilities in favor of getting patients, therefore, exceed the chances of getting clients. In neither can an excessive supply insure a corresponding demand.

At the bar, however, a profound knowledge of the principles and practice of the law meets with a ready appreciation by competitors, by courts, and even by clients, and may sometimes lead to judicial promotion, while the graces of oratory and the fascinations of eloquence, (vouchsafed to but few even in the forum,) are at once felt and applauded by the multitude. Oratory, with or without legal science, paves the way to political preferment. It is far different with the physicians, whose final judges (the patient, the nurse, and the family) are ignorant of the laws of pathology and therapeutics, although they might be fully able to appreciate an eloquent discourse at the bar or in a popular assembly. To sway the minds of thousands by words, be the cause a good or bad one, will gratify a thirst for popular fame, which a well directed dose of castor oil or quinine, even though it save a life, will never satiate. It is, says Hippocrates, assistance not speculation or words which the patient needs. B. D.]

Professor Leslie read a paper on "Competition at the Bar." He stated that it was of great economical importance that our institutions should be such as both to secure an ample supply of competent men to discharge the various duties of the profession, and to effect this without extravagant cost to the country, either by fees and salaries, or by demands upon the intellectual capital of the community. This last extravagance would occur if the bar were really a profession in which twenty fail for one who succeeds, as described by Adam Smith. Mr. Senior, commenting on this statement said that he believed the chances to be two to one in favor of a diligent law student, not two to one against him. He (Mr. Leslie) thought that even Mr. Senior's estimate of the chances might show a great loss. If a bar of 4,000 as in England, one-third, or more than 1,300 members, in excess, that would be a sacrifice, considering the ability and costly education of the majority of barristers. Mr. Leslie then compared the increase of the English bar with the remarkable decrease of the Irish bar. The rate of annual calls in the latter had risen from an average of twenty-three in the early part of this century, to sixteen in 1840, since which it had fallen to twelve in 1856. The statistics of the subscribers to the law library in Ireland presented similar characteristics. It was necessary, therefore, to show whether the supply of Irish barristers was in just proposition to the demand, since they were evidently naturally proportioning themselves. But as to the English bar, it was otherwise. An analysis of the whole bar of 4,000, separating those holding office, those abroad, those nominally "practising," and those who had (so far as the law reports enabled them to judge) actually obtainad practice, altogether brought out conclusively the fact that at least half the members of the English bar were not really working members of that profession. Mr. Leslie then analysed the various causes of this state of things, viz.: the increase of the prizes in the lottery of the law and the numbers ambitious of belonging to liberal professions, the diminution of military employment for certain classes after the peace of 1815, the state of university education, and the general superiority of the estimation in which the bar is held. He observed, in conclusion, with the modern discoveries in physical science promised to open up a new class of professions for the employment of the classes who now over-crowded the few monopolizing the title of liberal and learned.

VI.—*Mortality Statistics of the City of New Orleans;* compiled quarterly, from Jan. to Sept., 1857, from the weekly reports kindly furnished by Dr. H. D. Baldwin, Secretary of the Board of Health.

THE population of the city is generally estimated at over 150,000.

TIME.	DEATHS.	CHILDREN under 20 yrs. old.	U. STATES.	FOREIGN.
January to March	1,240	595	538	702
April to June	1,532	943	960	572
July to September	1,328	762	887	441
Total for nine months	4,100	2,300	2,385	1,715

Principal Diseases causing this mortality:

	JAN.—MAR.	APRIL—JUNE	JULY—SEPT.
Still Born	80	85	106
Tris. Nascent	42	25	67
Teething	19	55	49
Cholera Infantum	8	53	17
Infantile Convulsions	77	110	100
Croup	25	21	14
Scarlet Fever	27	29	9
Measles	40	57	4
Variola	21	34	26
Diarrhœa and Dysentery	84	125	116
Enteritis	21	33	60
Inflammation of Lungs	65	55	19
Consumption	157	169	150
Apoplexy	28	28	21
Congestion of Brain	17	25	32
Fever, Typhoid	27	29	30
" Miasmatic	11	18	39

Of yellow fever there was 1 case reported in June, 1 in July, 1 in August, 8 in the last week of September, 13 in the first week of October, 12 in the second week, and 36 in the third week; in all up to the present time, October 18th, 1857, 72 cases. S. C.

MONTHLY SUMMARY—METEOROLOGICAL REGISTER.

NEW ORLEANS, LA., Lat. 29° 57′ 30″ North; Long. 90° West; Altitude of Barom. above the level of the sea 35 feet.

From the Medical Purveying Office, United States Army, New Orleans.

1857.	Barometer.			Therm. Attached.			Thermometer.			Hygrometer.			Prevailing Winds.	Rain.	
Months.	Max. of Obs.	Min'm of Obs.	Mean.	Max.	Min'm	Mean.	Max.	Min'm	Mean	Max.	Min'm	Mean		No. of Days.	Quant'y
January...	7, A.M. 8th. 30.478	2 P.M. 30th. 29.934	30.299—	9 A.M. 2, 27 & 28 68	2 P.M. 19th 44	57.55—	2 & 9 2nd 68	7 A.M. 19th 28	50.56	2 & 9 P.M. 2d 67	7 A.M. 19th 26	48.36	N.E. E. & N.	7	2.68
Febuary ..	7, A.M. 10th. 30.696	2 P.M. 7th. 29.950	30.255—	9 P.M. 25 & 26 76	2 P.M. 9th & 10th 55	67.72+	9 P.M. 20th 79	7 A.M. 9th 42	64.98	2 & 9 P.M. 26th 73	7 A.M. 9th 38	62.29	S.E.; N. & E.	7	1.97
March	7 A.M. 7th. 30.374	7 A.M. 11th. 29.930	30.195+	9 a.m. 2 p several 75	several 55	66.08	2 P.M. 29th 78	7 A.M. 8th 43	62.35	2 P.M. 29th 74	7 A.M. 8th 41	58.90	N.E.; & S.E.	7	2.86
April.....	7 A.M. 6th, etc. 30.260	9 P.M. 30th. 29.876	30.104	9 P.M. 18th 77	7 A.M. 13th 59	68.44	2 P.M. 18th 79	7 A.M. 13th 47	64.96	2 P.M. 18th 74	7 A.M. 6th 44	61.36	N.; N.W. & S.E.	8	1.73
May......	7 A.M. 21st. 30.272	7 & 2. 3rd. 29.794	30.076+	2 P.M. 15th 84	7 P.M. 4th etc. 67	74.70+	2 P.M. 13, 14, 15, 85	7 A.M. 19th 63	74.16	2 P.M. 15th 79	7 A.M. 20th 58	69.57	S.E.; E. & N.W.	8	7.33
June.	7 A.M. 9th. 30.220	7 A.M. 24th. 29.850	30.093+	9 P.M. 11th 86	9 P.M. 23rd 74	80.79+	2 P.M. 11th 88	9 P.M. 23d 73	80.09	9 P.M. 12th 81	7 A.M. 19th 66	74.95	N.W.; S.E. & S.W.	6	2.90
July......	7 A.M. 7th. 30.252	9 P.M. 16th 29.972	30.135	9 P.M. 15th 88	7 P.M. 5th 77	85.76—	2 P.M. 22d 88	7 A.M. 4th & 5th 74	81.80	2 P.M. 16th 81	7 A.M. 4th 68	76.99	S.E.; E. & S.W.	16	5.86
August ...	7 A.M. 14th. 30.270	7 A.M. 11th 30.000	30.156+	2 P.M. 19th 86	2 P.M. 11th 79	82.27—	2 P.M. 19th, 27th 87	7 A.M. 11, 30, 31. 78	81.80	2 P.M. 19th 82	7 A.M. 30th 71	77.97	S.E.; S.W. & E.	19	4.64
September.	7 A.M. 30th. 30.350	9 P.M. 21st. 30.076	30.184—	2 P.M. 17 & 18 86	7 A.M. 24th, 25th 72	80.17+	2 P.M. 17th 87	7 A.M. 23d 70	80.15	2 & 9 P.M. 17th, 18th 81	7 A.M. 30th 60	75.24	N.E.; N. & E.	5	2.55
October 15	7 A.M. 1st. 30.244	2 P.M. 8th. 29.856		2 P.M. 4th. 80	7 A.M. 8th 70		2 P.M. 12th 79	7 A.M. 8th 66		2 P.M. 4th 76	7 A.M. 8th 63		N.E. E.; & N.	4	3.50

INTRODUCTION.

Among the memorable transactions of humanity, and the great events which have marked its eras and progress, as the catastrophies of the battle field, the downfall of kingdoms, destructive earthquakes, and remarkable appearances in the sidereal heavens, related in ancient history, Epidemics occupy but an obscure place. The slightest notice of yellow fever is no where found among ancient writers, although they have not failed to record, incidentally or directly, the time, place and progress of numerous epidemics, with more or less particularity, so that their characteristics may, now, after the lapse of so many centuries, be ascertained. It is now nearly three thousand years since the first temple arose in honor of Æsculapius. Four or five centuries later he was worshipped at Rome, where epidemics became both frequent and fatal. Homer opens his great poem by alluding to an epidemic which destroyed dogs, mules and men; another, 430, B. C., most destructive at Athens, was minutely described by Thucydides, himself having suffered from it; an epidemic which fell under the observation of Hippocrates, whose treatment of it was reckoned so successful that he was presented with a massive crown of gold, and the highest public honors. Five years later Athens was again visited.

Epidemics B. C.

Rome.

Athens.

Many epidemics prevailed at Rome before our era. In 263 and 212, (at the seige of Syracuse) and in 131, B. C., the Roman and many other nations suffered from pestilential visitations, as mentioned directly or incidentally by ancient authors.

Near the commencement of the Christian era, Celsus—and in the next century Galen—gave the world their learned works on medicine. In the sixth century the plague was general; and in A. D. 565, small-pox was first described in France, as it was in the tenth century by the Arabian physicians, Rhazes and Avicenna. Before the middle of the thirteenth century, medical schools existed at Montpellier and Damascus. The Parisian college of surgery soon followed. Descriptions of scurvy and plica, soon after, were recorded. Books on medicine appeared in greater number, and some new diseases were described in the fourteenth and fifteenth centuries, such as whooping cough, the sweating sickness, and St. Vitus' dance, which later was epidemic upon the Rhine.

Epidemics since the Christian era.

During this long period, so briefly sketched, yellow fever does not appear to have been noticed until the discovery of America by Columbus. Had it prevailed in ancient times, its prominent features, so very remarkable, at least in its advanced stages, would doubtlessly have been recorded.

Omitting on the present occasion its post-Columbian history for about three centuries, in order to reach its advent in New Orleans, in 1796, it is intended not to give its full history in this city, but to offer the reader a few (out of many) memoranda upon this subject.

Plan of this Essay.

The sketches now submitted to the public are intended to include the obscurest period of the history of yellow fever in New Orleans, from its invasion up to the first third of the present century. Since the spring of 1836, I have been an active participator in, and a vigilant observer and a faithtul recorder of, the sanitary history of this city, as I hope more fully to show on some future occasion. Except a view of the current epidemic, (not fairly history, because not yet elapsed, much less analyzed statistically) my voluminous details of all the great epidemics, since 1836, will necessarily be omitted for want of space in this limited memoir, as well as nearly all the data collected for the history of yellow fever for two centuries before its appearance in New Orleans. The waves of oblivion have already rolled over much of the sanitary history of New Orleans from 1796 to 1833. Of the fragments I have picked up, only a few can be given agreeably to my present plan. It is hoped that others, more fortunate, will be able to contribute more in illustration of this obscure though recent portion of sanitary history; otherwise, it will remain a blank forever. The epidemics since that of 1837 inclusive, have received or will receive such historical notice as will save them from oblivion, so that our successors will be able to give them a fair consideration, while posterity may find something to commend as well as blame, in the conduct, skill, and industry of the present Æsculapians.

Early sanitary era of Louisiana — important facts.

The labor, if not the result of my researches into the early history of yellow fever in New Orleans, has been great. The few and imperfect notices and documents originally published, and now accessible, devoid as they often are of statistical requirements and numerical appreciation, are of small value—and even these are fast drifting to the shoreless gulf of oblivion. The more distinguished events of Louisiana, military and civil, the more dramatic phases of humanity upon the distant shores of the Mississippi—the exteriorations of society upon which history is ever too prone to dwell exclusively, have found several able historians,* while the medical history, sanitary progress, climatic vicissitudes, topographical changes from forests to plantations—from plantations to cities—from swamps and palmetto lands, to sugar and cotton fields, have received little consideration during a most important period, when the Indian, Caucassian and African races first met and mingled in a boundless wilderness, diversified by vast rivers, plains, prairies, lakes, lagoons, swamps, colossal grasses, reeds and forests. The vital progression, health, longevity, as influenced by modes of life, clothing, lodging, crowding, building, exposure, labor, diet, temperance, cleanliness, bathing, domestic habits, social, educational, mental and physiological characteristics—all these must have produced results for good or evil which might guide the physiologist and the sanitarian in his reason-

Elements of Medical history.

Martin. Darby. French.

*The late Judge Martin, and Mr. Darby, of Washington, have contributed most ably to the history and geography of Louisiana. Mr. French has done and is doing good service by the publication of old memoirs and documents; all of which, are, however, almost wholly sterile in sanitary, climatic and medical details.

Norman.

Mr. Norman's beautifully illustrated volume, "New Orleans and Environs," contains an interesting historical sketch of Louisiana.

Gayarre.

Among the historians of Louisiana, the Hon. Charles Gayarré, for the extensiveness of his researches and the opulence of his contributions, stands unrivalled.

ings. The philosophical sanitarian cannot be two cautious in assigning epidemics and deteriorations of public health, to the sidereal influences—to the vengeance of Heaven, or to importations from the most distant nations. Contagionists have attributed our yellow fever (the paternity of which no nation is willing to own) to Siam, where it was never known, and for no better reason than that the country itself is at the uttermost end of the earth, and was less known than any other part except the very poles! It may be well to inquire, whether the elements of nature or the elements of society have altered during the last sixty years? Whether the stars are less simple, pure, chaste, moral, sober and regular now, than formerly! A change there is.

The reader of these desultory sketches, will, it is hoped, bear in mind that they are not intended to be strictly professional nor wholly devoid of that character. Principles and explanations, which, to a professional reader, may appear as the simplest truisms, may not prove such to all. While the writer claims no exemption from biases, he trusts he that is not a blind partizan, warring against contagion and quarantine, in regard to yellow fever. He has at least examined both sides of these questions, now paramount in the public mind, in their tendencies for good or evil to the present and future well-being of New Orleans, both in its internal and external relations.

gratified by the fact that, the Scandinavian Society of Antiquarians have communicated, through Professor Rafn, the pleasing intelligence, to Mr. B. M. Norman, of this city, that he has been chosen for degrees in the institution, of such a character that we may well be proud of his prominence in the scientific world. We have not space at present to give the details, but we will publish Professor Rafn's letter as our apology.

COPENHAGEN, October 2, 1855.

Dear Sir: Your letter of August 23d was welcome to the Managing Committee of the Royal Society of Nothern Antiquaries.

It was most gratifying to us, at the proposal of the committee, for the Anti-Columbian History of America, to enroll the name of B. M. Norman among the number of our society's fellows. The diploma has been transmitted to your kind care.

I beg you will accept my investigations concerning the Danish Runic stone, from the eleventh century, which, in the year 1852, has been found in the city of London, with my notices on several other Danish ones; as also of all the Runic inscriptions found in the Northern countries, particularly in Sweden, in which England and the other Western parts have been alluded to.—(*Memoirs des Antiquaires du Nord*, 1845, 1849, *p.* 286, *sq.*)

By the same opportunity, the Royal Society of Northern Antiquaries sends a duplicate of your diploma, as a fellow and founder of our Society; as also your diploma as a fellow of the Royal Medical Society of Copenhagen. The parcel containing the diplomas and memoirs has been recommended to the care of the Directors of Astor Library, New York, and transmitted in a box marked "W 76," addressed to this Library, and dispatched from Hamburg September 15, 1855, by Samuel Brombary, U. S. Consul, in the ship Washington, Captain Boysen.

I have the honor to be, dear sir,

Yours faithfully,

[Signed.] CHAS. C. RAFN.

BENNET DOWLER, M. D., New Orleans.

TABLEAU

OF

YELLOW FEVER OF 1853,

WITH

THE EPIDEMICS OF NEW ORLEANS,

CHAPTER I.

FIRST APPEARANCE OF YELLOW FEVER IN NEW ORLEANS—ITS PRELUDES AND CO-INCIDENTS.

THE ravages of epidemic yellow fever—in central and insular America, at no great distance—for two centuries, must have produced in New Orleans, from the day the city was founded, a well-grounded apprehension of impending danger. In the Northeastern portion of America yellow fever was older than New Orleans. It had prevailed in Boston in 1691, 1693, 1795; in New York in 1702, 1743, 1748, 1762, 1791, 1793, 1795; in Philadelphia in 1699, 1732, 1741, 1742, 1743, 1744, 1747, 1762, 1793, 1794; in Norfolk, Virginia, in 1747, 1795; in New Haven, Connecticut, in 1743, 1794; in Providence, Rhode Island, in 1794; in Baltimore in 1794, 1795, and in many other Northern towns; in Charleston, ten times anterior to its appearance in New Orleans, during a period of ninety-four years. 1796. Prelusory Epidemics. Atlantic cities

Yellow fever had approached the site of New Orleans sixteen years before the city was founded, having appeared at Biloxi, in 1702, ninety miles distant, a French military station and settlement, founded by Iberville, in May, 1699; and, also, at Mobile three years later. The great prevalence of yellow fever, not only in the new but the old world, as in Cadiz in 1705, 1731, 1733, 1734, 1744, 1764, must have caused ceaseless apprehension of danger to the city, had the disease been of an importable character, and the more so as the population consisted of various nations and races engaged in commercial pursuits lying within the yellow fever region—a population ceded from King to King, and sold from Republic to Republic, agreeably to the caprice or cupidity of its masters Gulf of Mexico. Spain.

The year 1796, signalized by the irruption of yellow fever in New Orleans, presented the most incontestable facts deserving of the consideration of contagionists. New Orleans from its foundation (it may be repeated) had been closely connected by geographical position, commercial intercouse, languages, and governments, with both insular and continental America, where yellow fever had prevailed for centuries under Spanish, French and English rule, yet always exempt up to this period. 1796.

Let us suggest this postulate: suppose that simultaneously with the first invasion of yellow fever, near the mouth of the Mississippi, a handful of immigrants, who had five years previously arrived in the midst of a vast wilderness, fifteen hundred miles distant, in latitude thirty-nine degrees North, nearly ten degrees North of New Orleans, at a time when there were no steamboats, when it required several months to reach the former by the river—I say, suppose that yellow fever should break out at both of these remote centres simultaneously, would it be fair to conclude that personal contagion could, under such conditions, be communicated? Such events did occur. The town of Gallipolis, on the Ohio river, thirty-nine degrees North latitude, settled in 1791 by immigrants from Paris, on an elevated diluvial ormation then in the midst of a vast wilderness just beginning to be settled, was, n 1796, severely visited with yellow fever, attended with black vomit. The late Professor Potter, of the University of Maryland, struck with this remarkable isolated epidemic, (which he used to dilate upon in his lectures) took the necessary steps to investigate it the very next year after its occurrence, when Major Prior of the army an eye-witness, arrived in Baltimore from Gallipolis, and gave the professor a statement in writing, by which it appeared that half of the garrison and many of the French settlers died in ten days from this malady. This strange event in the desert excited great surprise at the time. The army report, by the surgeon-general, (p, 9) "refers to the journal of a voyage down the Ohio, in 1796, by Mr. A. Ellicott. This judicious observer was a witness at Gallipolis to the disease which raged violently, the fatal cases being generally attended with black vomit. 'The fever could not not,' he says, 'have been taken there from the Atlantic States, as my boat was the first that descended the river in the spring. Neither could it have been taken from New Orleans, as there is no communcition up the river at that season of the year.'"

In Gallipolis

1796.

First epidemic in New Orleans.

Although an epidemic prevailed in New Orleans in 1769, the character of which has not been determined, yet it is highly probable that the disease was not yellow fever. Before a generation had passed away the yellow fever having, without doubt, appeared in 1796 as an epidemic, the numerous writers who asserted that the latter year ushered in this disease for the first time, in the city, could have informed themselves by consulting living witnesses as to the material facts of the case, and would have been contradicted, had they made erroneous statements as to the period of its invasion. A single authority, that of M. Frasans, has been quoted by several authors to show that it appeared first in New Orleans in 1795—among these is M. Moreau de Jonnès, though from his quotation from the former, 1796 will apply as well as 1795, while cotemporaneous writers agree as to the former. Although M. Frasans seems to represent the contagion-party of New Orleans, long since, his statement is important as fixing the date of the irruption of yellow fever in the city. He says (as quoted by Moreau de Jonnès, *Monographie*, 181) that in 1802, the people of New Orleans, among whom yellow fever had appeared six or seven years before, considered it as of foreign origin, that is, it had been imported from the United States. (Frasans. *Vue de la Colonie, &c.*, 86, 91, Paris, 1803.) It does not seem that he was positive whether the first epidemic was in 1795 or 1796.

Frasans.

It may be proper to mention that the late Dr. Drake, states on the authority of Richard Relf, Esq, of New Orleans, one of the oldest and most respectable Anglo-American citizens, "that yellow fever occurred, he himself being a patient, in 1791.

Relf.

(Dis. Valley Miss. 100.) It does not appear from this statement whether the disease was sporadic or epidemic; probably it was the former.

That the health of New Orleans anterior to the appearance of yellow fever was unsurpassed by any city in America, cannot be a matter of doubt, as I have shown in various publications, a summary of which may be seen in the New Orleans Directory for 1852, wherein numerous authorities, official and private, chiefly in the French language, are given, as Charlevoix, DuPratz, LaHarpe, Lozières, Duvallon, Robin and others. 1796. Health of New Orleans in early times.

Dr. Lind, though at the expense of his theory of marsh-poison, allows "that the inhabitants of New Orleans suffer no inconvenience from their situation in marshes even during the rainy season;" (Hot Climates, 35;) a remark quoted, not to show swamps are good and convenient, but to show that in his day the city was salubrious; he carefully noticed the prevalence of yellow fever in Pensacola and other Southern towns during the last century. Lind.

The population of the city, by the census of 1785 was 4,980—by that of 1788 it was 5,338—by that of 1803 it had increased to 8,056. It is probable that it did not exceed 6,000 at the time yellow fever appeared in 1796. Of the mortality of that year no record has been seen by the writer. From that period to 1853 it is almost certain that several cases have occurred every year in the city, often only four or five.* Population.

In the year 1796, yellow fever appeared in Newburyport, Boston, New York, Charleston, Wilmington, West Indies, New Granada. Co-incident epidemics.

Although it is not intended upon this occasion to give even a sketch of the methods of treating yellow fever, it may be proper to notice the method of cure proposed in New Orleans during the first epidemic, by a Spanish gentleman, Dr. Masdevall, physician to Charles IV, published in this city, in a work dedicated to the Governor, the Baron de Carondelet, in 1796: The doctor's remedy consisted of an antimonial mixture, *in viper-water;* 5 ounces of emetic wine; 1 ounce of cream of tartar; a tea spoon full for a dose. After the fifth day give an electuary of salt of wormwood, tartar emetic and Peruvian bark, in divided doses, the third and last remedy, *(lavement)* called the *blessed laxative*, was composed of antimonial wine, water, honey and oil. He rejected cordials, blisters and blood letting. He considered life as residing in the blood, as declared by Moses (Leviticus xvii, 14) and denounces venesection as dangerous for that reason, as life and health depend upon it. He maintains that his method is a true specific against all the fevers of Spain and America, as he knew from an experience of twenty years. His most Catholic Majesty commanded the Spanish physicians to follow his prescription and to prescribe nothing else. He blamed the physicians of Havana for not having adopted this "blessed" method of treatment. (Med. Rep. vi.)

*During 1796 the basin of canal Carondelet was excavated. The main body of the canal had been finished previously. Canal Carondelet.

CHAPTER II.

HISTORICAL NOTES OF YELLOW FEVER TO THE CLOSE OF THE EIGHTEENTH AND THE FIRST QUARTER OF THE NINETEENTH CENTURY.

1797. Philadelphia. Providence. New Design.

I have found no satisfactory record of an epidemic in New Orleans in 1797.* In Philadelphia 1000, and in Providence 45 died of yellow fever. In the remote West, "at New Design, fifteen miles from the Mississippi river, and twenty from St. Louis, it carried off more than one-fourth of the inhabitants, although no person during the preceding twelve months had come to this village from any place at which the malady prevailed. As these facts are attested by Dr. Watkins, who had seen the disease in Philadelphia, and as identity of disease supposes an identity of cause, it is shown indisputably that fevers with the pathognomonic features of typhus icterodes [yellow fever] do occur in positions which forbid the assumption of importation." (Stat. Report, U. S. Army, 9.)

1798. Dr. Brown.

The yellow fever which appeared in Boston, was, according to Dr. Samuel Brown, preluded by and accompanied with the following gloomy appearances of nature, or rather brown studies of the author, who gravely sets forth that "The common atmosphere, for the most part, was opaque and smoky, as if the earth's surface were undergoing a slow combustion. It seemed a heterogeneous mixture of particles in a state of opposition and propulsion; respiration frequent and unrefreshing. The sun, in mid-day height, appeared as a volume of blood, dark and angry. As it declined to the western horizon, its diameter widened greatly; and at an hour's height, or more, was almost invisible, or shrouded as with sack cloth. These appearances, however, were not constant."

In New York the epidemic raged with extraordinary mortality. It has been estimated that more than one in thirty of the entire population died in a few weeks, mostly in August.

Epidemics in Philadelphia, Wilmington, New London, Chester, Huntington, Petersburg, Alexandria, (Va.) West Indies.

1799.

The prevalence of yellow fever in New Orleans, in 1799, is referred to in the city journals twenty years subsequently.

New Orleans.

"Dr. Dow informed me," says Dr. Rush, "in his visit to Philadelphia, in the year 1800, that the natives and old citizens of New Orleans, who retired into the country during the prevalence of yellow fever in that city, the year before, [1799] were often effected by it, while all such persons as did not change their residence escaped it." (Rush, Inq., iv, 126.)

1800.

Charleston, Philadelphia: "In no year since the prevalence of the fever was the desertion so general." (Rush, iv.) Boston, New York, Vera Cruz, West Indies

Cadiz: Persons long resident in the city, as well as West Indians, were remarkably exempt. General alarm in Europe, particularly in Spain, France, and

*M. Victor Debouchel, in his history of Louisiana—1841—says that yellow fever desolated New Orleans in the following years, namely: 1767, 1797, 1802, 1806, 1810, 1814, 1818, 1822, 1824, 1827, 1831, 1835, 1837—an enumeration which does not, in a number of instances, coincide with the most reliable authorities.

the Germanic States. Quarantine rigid against yellow fever generally called the Pestilence, American Plague, &c., &c. Rush's works translated into German.

Charleston: 134 died, including two children born in the city; the residue strangers exclusively. "Some instances have been observed of our youth, who have returned from a more northern latitude, after an absence of three, four and five years, and in one instance of twelve years, without contracting this inhospitable disease. The only exception to this remark are two; the one after an absence of five and the other of nine years." (Dr. Ramsay.) [Probably the two Creole children were born of unacclimated parents.] 1800. Charleston.

In Havana, 9,977 perished from yellow fever. Havana.

The Intendant of Cuba, El Sr. Don Pablo Valiente chartered the Dolphin to take himself, family and suite to Spain, touched at Charleston; and, having anchored in the bay of Cadiz, he went ashore with his party two days after, on the 8th of July. A month later the yellow fever appeared in Cadiz, whereupon Valiente was arrested upon a criminal charge for having imported yellow fever contagion from Havana and Charleston; the former he left in May; the latter he touched at June 2d, and left eight days after. At neither place was there any yellow fever. No yellow fever appeared on board of the Dolphin during the voyage, though three sailors had died. The Intendant, after eleven months' imprisonment, was acquitted at Seville, and was afterwards promoted by the Government, probably as a compensation for, his wrongs Valiente.

Seville: out of 80,000 souls, 76,000 took the disease.

Cadiz: 14,000 fled, 57,499 remained, 48,500 sickened, 7,387 died.

Dr. Hosack, and many others, having adopted Dr. Mitchell's theory of septic acid as being the cause, and alkalies as the preventive of yellow fever. Lime water and the like were reckoned to be vastly important in neutralizing the septic acid, which was considered very corrosive, particularly after black vomit appeared. Dr. Cathrall, of Philadelphia, read a paper before the American Philosophical Society, on the analysis of black vomit, asserted that there was an acid in this liquid which is inert to the taste and smell, and harmless when swallowed. Black vomit having been "kept corked in a phial eight or ten days, it assumed an agreeable saccharine odor; kept two years in a state of rest, the flakey particles became perfectly separated—on agitation, it became immediately incorporated, and after remaining six months, showed scarce any disposition to separate. It is, as he says, neither blood nor bile, nor a mixture of the two." (Med. Rep. iv.) The writer has several specimens of black vomit, ten to fifteen years old, which does not appear to change from age. 1800.

In March, 1801, Baron de Carondelet, in an official document, setforth the importance of improving the topography of the city, so as to drain off into Canal Carondelet the stagnant waters which then abounded "near the city," and which he regarded as "the cause of much mortality;" a measure which he says "would put an end to putrid fevers," (Martin ii, 176–7) in which category he, doubtless, included yellow fever, which a few months later occurred as an epidemic. 1801. New Orleans. Carondelet.

Yellow fever in New Orleans: Dr. Snead, of this city, detailed the mode of treatment and criticised it as inefficient. (Med. Rep. ix.) 1801.

Yellow fever in Savannah, Norfolk, Norwich, Ct., New Bedford, Mass., in New

York where 140 died in October. In Charleston the celebrated Michaux suffered an attack; one-eighth of the unacclimated perished.

In Philadelphia, sporadic. (Rush, iv.)

In Havana: Mr. Morton, American Consul in that city, estimates the population within and without the walls at 95,000; mortality 2,366.

Dr. Oyarvida, of Havana, published a work in the Spanish language, to show that yellow fever is contagious, asserting its importation from the United States, avowing that when a person is exposed to it and escapes the disease, this escape is owing to the goodness of God.

In Vera Cruz, Jamaica, St. Domingo, Seville, Medina, Sydonia, (Spain) "on a high hill." Leghorn, Italy, 150 died daily.

1802. The government of the United States applied to the Spanish government for permission to establish a Marine Hospital at New Orleans, for American seamen, many having died there in a destitute condition.

1802. Boston—sixty deaths from yellow fever; at Portsmouth, New Hampshire, 10; Wilmington, Delaware, 86; Philadelphia, 250; Baltimore, unknown.

1802. Yellow fever at Charleston—96 deaths; more than half of the attacked recovered; none died under twelve years old; three died after a residence of eighteen months; a few strangers escaped without an attack; not a native white, black or mullato was attacked. (Dr. Ramsay.)

Vera Cruz—428 cases admitted into the Hospital of St. Sabastian—60 died; in the city 1,500 of yellow fever.

The reign of Septon. Dr. Mitchell, of New York, (born in 1763—died in 1831) learned alike in physic, physics and politics, influential at home and abroad, exercised at the beginning of the present century an influence over the public mind, rivaling that of Dr. Rush. This great New York professor and member of Congress, having discovered the demon of all epidemics, particularly that of yellow fever, called by him Septon, that reigned by virtue of the principle of Acidity in the earth, air and water, causing corruption everywhere; whereupon he inaugurated Alcalinity into power with a scrub broom in one hand and a bucket of lime water or soap suds in the other, by which only "Grim Septon" could be conquered.

Alkalies as preventives.

1802. Dr. Mitchell moved in Congress the appointment of a committee with the view of reporting on the purification of ships by alkalies, in order to destroy this pestilential septon. The Secretary of the Navy adopted the theory, or at least the practice, which latter he ordered to be carried into effect. Books, pamphlets and letters soon appeared against Septon, and for Alcalics. The next year an article appeared in the Medical Repository, having the title following: "Dr. Chalmers on the Acidity of the Atmosphere of South Carolina"! The fading of goods, the rusting of metals, and other effects of atmospheric acidity were gravely announced as indubitable proofs of this theory.

Air acid.

The yellow fever prevailed in several cities of the United States; 600 to 700 died out of 1,600 or 1,700 cases in New York, in August and September; 196 in Philadelphia; 200 in Alexandria, Virginia; prevailed at Cattskill, among the hills of New York.

At Malaga, in Spain, 12,000 to 13,000 died; some accounts represent the number as low as 6,884.

Dr. Rush represents this as a year exempt from epidemic yellow fever in the United States, Charleston excepted. It prevailed, however, in New Orleans

In Charleston, 200 to 300 deaths. Prevailed in Winchester, Virginia.

Vera Cruz: total mortality 1,310. Yellow fever prevailed here, also in the West Indies; in Havana 4,766 died.

Leghorn: 6,000 left for Pisa, as did the French army, taking 180 yellow fever cases with them; no propagation of the diseases at Pisa. (Quar. Rep.) 1804.

Malaga, in Spain, out of 110,000 only 7,000 escaped attacks, and 26,000 died of this disease in four weeks. A more reliable statement (that of Arejula, cited Rep. Quar.) gives the population, in July, exclusive of the troops and prisoners, at 36,008; of these 4,548 fled, 18,787 sickened, and 11,486 died.

Carthagena: out of 32,000 there died 14,940.

At Gibraltar, in a few weeks, beginning with August, out of a population of 15,000, no less than 5,733 fell victims, including civilians 4,864, military 869, that is, nearly two out of five. [Subsequent epidemics prevailed on this rock, as in 1813–14, 1828. During the latter year, from August to the 14th of January, 1,677 expired on this rock from yellow fever.]

Many cities of Spain, including Cadiz, were desolated. The population of Spain diminished one million! The official report of deaths from yellow fever amounted to 124,200 for the year.

It is remarkable that during the rigid quarantine which prevailed about the beginning of the present century in Spain, yellow fever raged more, and caused a mortality incomparably greater than was ever known before or since, in so much that various authorities might be produced in which the diminution of population in that kingdom for a single year has been estimated, as above, at one million, owing chiefly to the ravages of this disease. 1804.

As illustrative of the supremacy of the doctrine of contagion, it may be proper to mention that Carlos, King of Spain, by proclamation, conferred on Don Cabanellas and his two children, an annuity of twelve hundred dollars, making Don Cabanellas physician to the royal household, bestowing other privileges on him for having slept one night with his children in the bed whereon yellow fever victims had died in the Lazaretto. A number of galley convicts, in chains, who voluntarily accompanied the Don, for the night, had one year's punishment remitted from their penalties. The party consisted of fifty persons, who suffered no harm. (Med. Rep. x.) Great was the astonishment of His Most Catholic Majesty and his doctors. 1805.

New York: 302 deaths; 116 having been natives. (Med. Rep. x.) 1805.

Providence, R. I.: 30 cases; 10 deaths. (Ib.)

Philadelphia: 300 to 400 deaths. (Rush.)

New Haven, Ct., Gloucester county, N. J., Chester county, Pa, (Ib.)

Havana: H. Hill, American Consul at Havana, reported to the United States Department of State the names of 86 out of 100 American seamen dying in that city, all but one, of yellow fever. (Med. Rep. x.)

St. Anne's Barrack's, Barbadoes: of 278 men recently arrived from England, 70 died in twenty-three days, ending August 20th. (Bancroft.)

Quebec, near the 47th parallel of North latitude, founded (more than a century before New Orleans) upon Silurian rocks, which rise abruptly more than three hundred feet above the tide which washes its base, about 400 miles from sea, was for the first and last time invaded by the yellow fever, in the middle of August; but, September setting in very cold, the disease was not of long duration, though it was nearly as severe as that of the West Indies in malignity, especially among Quebec. 1805.

the troops, a company of 55 belonging to an English regiment perished except six. (Walsh, cited by Moreau de Jonnès.) This epidemic has been described by the usual criteria of yellow fever—haemorrhages, vomitings, yellowness, &c.

1806. No epidemic in the U. S.: In the penitentiary at Richmond, Va,, yellow fever occurred. The Board of Health of New York recommended that certain parts of the city which had been much infested with yellow fever, should be reserved for warehouses only, not leased to families.

1807. Charleston: 162 deaths; Philadelphia 3; Savannah; New York 20 cases. (Med. Rep.)

1808. No epidemic except in the town of St. Mary's, in Georgia; half that remained in town died, including Drs. Hitchcock, Turner and Stowell. (Ib.)

Savannah. (Townsend.)

1809. New Orleans: Mr. Gallatin, Secretary of the Treasury, reported the expense at the Charity Hospital for the treatment of sick seamen, at 75 cents per day, each, amounting to $3,542 31. The number of deaths from yellow fever unknown; sporadic cases in Charleston, Philadelphia and Brooklyn.

1810. In Havana, yellow fever destroyed 4,305; Philadelphia 3 deaths; sporadic at Gibraltar; severe at Cadiz and Carthagena.

Population of New Orleans according to U. S. census: city and suburbs 17,242; precincts 7,310 total 24,552.*

1811. New Orleans (Darby, Stat. La. 267.) Philadelphia 5 deaths. Amboy, N. J.

1812. Philadelphia 3 deaths; Cadiz, epidemic

Earthquake in the valley of the Mississippi; disastrous at New Madrid.

1813. Spain; Philadelphia 6 deaths.

1814. Philadelphia 7 deaths; epidemic at Cadiz.

1815. West Indies; Philadelphia, two deaths.

1816. Philadelphia, two deaths.

New Orleans. The city and state authorities, fully alive to the sanitary interest of New Orleans, enacted laws with this purpose, of the most stringent character. Those

Sanitary laws of March 6th, 1816, and of March 18th, 1817, for extensive views, special enumerations, and exact descriptions of whatsoever, were then, or have been since regarded as causes of disease, may be equaled but not surpassed by the present generation. One of these acts, covering fourteen pages, having twenty-four sections, exhausts the subject of Hygïenie legislation—on paper, at least—and, with

1817. no apparent effect, as to the march of yellow fever. Mr. Darby says at this period "the streets are not yet paved."

Quarantine laws enacted in the winter or before the hot season. (The date not recollected.)

1817. Aug. to Dec. 30th. Epidemic in New Orleans: Mortality of white male adults, 760; of white female adults, 63; a ratio of more than twelve times less than the former. Total mortality for five months 1142.

The Physico-Medical Society report the deaths, in August, 304; in September, 178; in October, 91; in November 91; in December, 74. But from these and various other data, I estimate the deaths from yellow fever this year at 800.

Natchez, 33° 31′ N.: In a small population one hundred and thirty-four died of yellow fever.—Dr. Perlee. Dr. Cartwright refers the epidemic to local causes, as filth, a candle factory, offal, &c. (Med. Rec. ix.)

In Charleston, 270; total mortality 1249. (Mills' Statist.)

*Mr. Darby says that "New Orleans and suburbs contained, by the census, 17,242."

CHAPTER III.

QUARANTINE ERA.

Governor J. Villeré, January 6th, 1818, in his annual messege, says. "That during the course of the last summer the yellow fever had extended its ravages over the city, chiefly falling on new comers, but many of our citizens were its victims." He thinks that the disease was imported, and regards quarantine laws favorably. 1817. Gov. Villere.

The yellow fever reappeared in New Orleans; mortuary tableau; deaths of white male adults 324; of female adults 81; white children 87; black male adults 219; black female adults 162; black children 277. The mortality augmented in each month until September, in which 166 died. Total whites 392; total blacks 658; grand total 1151.* 1818. Mortality.

An act, approved March 6th, repeals the act establishing a Board of Health in New Orleans, the health officer and all laws for the prevention of the introduction of pestilential, malignant and infectious diseases; directs the sale of the Lazaretto and all its property; investing the Governor with authority to establish quarantine by proclamation at his sole discretion. 1819.

Yellow fever quarantine is founded on some known law of nature, on some ascertained uniform antecedent or leading fact or it is not. That yellow fever is produced by a cause or antecedent as invariable as the rising and setting of the sun is not the less certain, because it is wholly unknown, cannot be doubted. Even the games of chance, so called, happen in strict conformity to a changeless law as much as the winds, waves and eclipses. If importation be the antecedent of yellow fever in New Orleans, let quarantine against it be not only strict, but eternal If the act of the Legislature of Louisiana in the winter of 1817, establishing a code of quarantine laws was wise, the repeal of those laws in 1818 was foolish. But it may be said that these laws had failed to prevent an epidemic during the summer of 1817. True. But why has the same course been pursued since, and why pursue it again as is intended now? The experiment has been often repeated in various countries and with like results—results mischievous, demoralizing, repulsive to humanity, and tending to increase the mortality of yellow fever during an epidemic. If the people of New Orleans could be brought to believe in the contagiousness of this disease, benevolent as they are known to be, the sick would be secluded, intercourse would be so restricted that many would perish from neglect. Of this more hereafter.

The Mayor and Council of New Orleans provide medical attendance, medicines, bread, meat, wine and the like for the sick poor. The preamble to the ordinance says: "Whereas, the disease actually reigning in the city of New Orleans is prin- 1819. Aug. 24th—charity.

In a letter from the late eminent Judge F. X. Martin, the historian, published in the journals of 1818, he gives a flattering account of the city as follows: Professional men make fortunes; land ten miles above and below the city worth from $2000 to $4000 per acre; a single hand for a year $750 to $1000; "if born in the country or seasoned thereto, a slave is worth from $1500 to $2000 in ready money; a genteel house servant $3000." Prosperity of the city. Martin.

*This is supposed to refer to one acre fronting on the river and running back 40 arpents or acres.

cipally among strangers lately arrived in this city, and not yet inured to the climate and that many of them are laboring under pecuniary distress, Resolved," &c.

Mortality. The city proper: had whites 13,604; blacks 13,592. The city and suburbs contained 45,968 souls. Mortality by months, beginning with January: 70—102—97

1819. —78—120—130—130—313—594—313—134—109. Deaths of negroes are distributed almost equally among the months of the year. By this tableau it appears that

Races. six white men died for one white woman. Total mortality 2,190. These figures,

Nuttal. taken from the report of the Medical Society, apply probably only to the city proper. Mr. Nuttal, the naturalist, in his travels, estimates the victims of yellow fever for this year in the city at from five to six thousand, an aggregate greatly exceeding probability.

Army Report. In the official report of the Surgean General U. S., it is said: "At New Orleans it was estimated that upwards of 3,000 died of yellow fever; and it was not until after the first of December that it was deemed prudent to return either to this city or Natchez. The interior of the country, in the Southern States, seemed to suffer in a corresponding ratio. In the West Indies the fever exhibited perhaps a still greater mortality." (10.)

Medical Society. The grand total mortality, according to the report of the Medical Society (supposed to inciude only the incorporated limits) is but 1,337; the males being 1,142; females, 195; blacks, male adults, 182; female, 168. Deaths of blacks little, if any, increased during the three epidemic months, while the deaths of white adults increased from 64 in Jnly, to 485 in September.

The first two cases of yellow fever occurred May 7th and 12th; the last death December 9th.

1819. Dr. Dupuy De Chamberry, of New Orleans, in his historical sketch of yellow fever, as it appeared in this city in 1819, says:

"I formerly believed the yellow fever to be contagious, but since I have been in the midst of it, my numerous practical observations have never been able to furnish me with one proof of this much dreaded attribnte. Indeed the result has been quite the reverse; and, I am now convinced that the disease is permanently fixed to the spot, and within the limits of the place which has created it. Not one case occurred beyond the limits of the city, during its prevalence in the years 1817 and 1819, that could be traced to any of our innumerable patients, although daily intercourse was kept up with people of the neighboring estates and plantations. A great number of our inhabitants who carried the seeds of the disorder abroad, seeking refuge from the danger at a distance, suffered an attack of the fever and died; but in no instance was it communicated to their friends. *Fifty times* have I had my hands and face besmeared with the putrid blood, black vomit, or fœtid slimy matter of perspiration. Fifty times have I been immersed in the effluvia issuing from a dead or living subject, and never been infected by the disease. From extensive observations, I infer, that the yellow fever of this place is a disease, *sui generis*, the product of local causes, and neither contagious, nor exportable. Flight from the infected spot is the only preservative, and a distance of three miles appears to be quite sufficient to inspire the fullest confidence."

1819. July 4th to Dec. 1st. Yellow fever at Mobile: Five hundred remained in the city, of whom 274 died. At Forts Jackson, St. Stevens, and Claiborne. Prevailed on Tombigbee and Alabama rivers. (Med. Rec. iv, 161; Rep. Committee, Mobile.)

New York, Philadelphia, 13 fatal cases; Baltimore, —; Charleston, 176; total mortality, 1,092. (Mills' Statist.) In Havana, 5,162 victims.

Governor Villeré declares "that the scourge of war is preferable to yellow fever;" "that the city had been twice ravaged in three years," [1817 and 1819;] that it is contagious." He urges the Legislature to pass quarantine laws, in which he has the greatest confidense as a preventive. 1820. January 5th.

Governor Villeré, a firm advocate for contagion and quarantine, in his message of November 22d, in relation to the then existing epidemic yellow fever, says: Governor's message.

"All the Medical Faculty appear definitively to have adopted the opinion that the yellow fever, which, during the last year, has plunged us once more into mourning and desolation, is not contagious." But he argues: "During the months of August, September and October, there has been almost constantly in the prison of this distressed city, *a great number of prisoners*, and not a single one among them has been affected with the disorder." "If the yellow fever were natural to our climate, how has it happened that among such a number of persons heaped together in so small a space as the prison of the city, not a single one should have been attacked."* [Dr. Chabert, a physician of New Orleans, opposed the Governor's argument as to the prison, and maintained that the Creoles never take the yellow fever, though they do not shut themselves up to avoid it. (Friend of the Laws, Dec, 23d.)] Dr. Chabert. Medical Society.

*The immunity in the prison will be inquired into in the sequel.

The Governor reviews the report of the Medical Society for the current year, dissents from its deductions, which he regards as those of all the faculty, and denies what he terms "*the constitutionality of the yellow fever.*"

New Orleans visited by an epidemic: Deaths from yellow fever in the hospital 82. First admission, July 21; the last, December 21. 1820.

Dr. Lambert treated yellow fever with repeated doses of opium and coffee. Opium.

Yellow fever prevailed in Middletown, Ct.; in New York; 150 died from August 21 to October 20; (some doctors affirm, others deny that the fever was yellow fever;) prevailed in Savannah.

The yellow fever having prevailed in Philadelphia, in 1820, for the last time for the period of thirty-three years, after a long and mortal cycle of at least twenty epidemics in about one century, it may be proper in this place to give a summary of its recent reappearance in that city, both as it respects its extent and its quarantine import. Whether the recent endemic in that city is to be regarded as the sad souvenir of times long past, or as the precursor of as sad times to come, neither the contagionists nor the anti-contagionists can tell.

The yellow fever which appeared in Philadelphia in July, 1853, some time after the arrival of the bark Mandarin from Cienfuegos, has been referred to by the citizens of New Orleans as a proof of the beneficial effects of quarantine in arresting the progress of contagion, but without any reason whatever. This matter having been investigated in the College of Physicians by Dr. W. Jewell, the following conclusions were arrived at and published in the Transactions of the College, which are here subjoined, from the Boston Medical Journal of November; (the fourth conclusion being a mere theoretical opinion, is omitted): 1853. Philadelphia.

"1. That no disease of a malignant type was prevailing in our city previous to the arrival of the Mandarin.

2. That none of the seamen discharged from the Mandarin have sickened.

3. That none of the laborers employed in unloading the Mandarin have taken the disease.

* * * * * * * * *

5. That in no instance can the disease be traced to any individual, except among those who either visited or resided in the immediate vicinity of South and Lombard street wharves.

6. In no case has the disease been communicated to any person visiting, or engaged in attendance upon the sick.

7. Up to this period, not a single instance can be met with, having its origin to the south of where the Mandarin lay last."

* * * * * * * * *

"Dr. T. H. Bache stated that the number of cases of yellow fever admitted into the Pennsylvania Hospital had been *twenty-three;* of these *fourteen* had died, *seven* recovered, and *two* still remain.* These cases were placed in the common wards, without any attempt to separate them from, or prevent intercourse between them and the other patients, but in no instance had the disease been communicated to the latter."

The comments of the learned Dr. Reese* on these events are subjoined in a foot note, from his medical Gazette of December, 1853.

1821. St. Augustine. Dr. Francis, of New York, upon the authority of Judge Andrews, Mr. Delespine and Col. Forbes, says that the yellow fever which devastated St. Augustine, in Florida, chiefly during the month of October, "did not affect a single individual from the West Indies, nor a native of the country,† nor any one who had previously suffered from yellow fever. Forty or fifty deaths occurred among newly arrived immigrants before the alarm became general. Eleven deaths happened in one day. About 200 were exposed to the influence of the disease. Of this aggregate 140 were attacked, of which 132 died, including three blacks. Forty deaths

Army Reports. took place in the garrison, in a body of 120 soldiers." (Townsend, 381-2.) The official army report asserts that this epidemic was "entirely confined to strangers,

Immunity. that is, all persons not enured to the atmosphere of the city by nativity, or a residence of a long series of years. Spaniards or natives,‡ resident in the country, who had the temerity to venture into the city during its prevalence, were liable to its attack, though in a milder degree than immigrants." (31.)

Prevailed in Baltimore.

Without anticipating what is to be said about the impending quarantine of New Orleans, it may be remarked that it is hoped the strict rules which were adopted during the era that has just been alluded to will be rëenacted, so that if the quarantine doctors should become converted to non-contagion or to contagion, the law will, nevertheless, be enforced with unceasing vigilance and rigidity, because a single exception—the admission of a passenger, bale of goods, or letter,

*October 6th.

†How strange that the antiquated fable of contagion should still haunt the popular creed; and be made the hobby-horse on which as many flippant political doctors ride into places of profit, under that silly relic of barbarism known as the "Quarantine regulations," which are as powerless in keeping out yellow fever from the cities, in which it is generated by local sources of effluvia, as they would be in imposing restrictions against the waves of "old ocean rising in her wrath."

Even in Philadelphia, where a few score of cases have occurred in a district infected by an old and filthy common sewer, we find certain medical savans hunting for its cause in an old ship, guiltless of aught but bilge water, and this, with an obvious source of yellow fever under their noses. When will this ghost of contagion and importation be exorcised? Not while knaves can make money by spirit rapping, which belongs to the same category."

‡The apparent contradiction in these statements grows out of the indiscriminate use of the word country, which in Dr. F.'s account, means a native of the city, not a native of the rural district, as in the latter statement—all of which will be discussed hereafter.

might, by a single spark, ignite the whole magazine of humanity into a fever-explosion. Under former quarantines in this city, the resident physician and the health officer, took the following oath: "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," &c.; under the head of "other duties," a vast many things are included—one of which required the quarantining of all vessels, how healthy so ever they may be, and how healthy so ever may have been the ports whence they sailed, from the 15° S. lat. to 24° N. lat,; a very liberal belt of 39°—covering the West Indies, nearly all of South America, the whole of Central Africa and Southern Asia. On the South side a triangular piece of America, and the Hottentot portion of Africa, and nearly all of New Holland remained free, provided they did not pass through the interdicted regions.

CHAPTER IV.

NEW QUARANTINE EPOCH—ITS EPIDEMICS—ITS RATIOCINATIONS AND INDUCTIONS, LEGAL, MEDICAL AND SOPHISTICAL.

The quarantine laws passed by the Legislature in February, 1821, creating a Board of Health with the most plenary powers, legislative, judicial, executive, pecuniary, and sanitary, modeled after codes the most rigid, and enforced by the heaviest penalties, were carried into effect in March of the same year. The quarantine ground, established at the English Turn, including incidental expenses, cost over twenty-two thousand dollars. The year proved salubrious—a result attributed to the strict quarantine. The Governor, in January, 1822, congratulated the Legislature upon the good fortune of New Orleans as being "*the healthiest city*" *in the Union*. But at the close of August, the yellow fever appeared; it augmented throughout September, but did not reach its culminating point until October, the month of greatest mortality, having amounted to 665, exceeding that of the preceding month by 83. Governor Robertson's next message breathed sorrow and despair. "It is," says he, "an idle waste of time for me to inquire into the causes, origin and nature of this dreadful malady." * * * "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 course of events since the publication of the New Orleans Directory for 1852, renders it necessary to recapitulate, and fortify with additional proof, the postulates there laid down, as it respects the quarantine of 1821—the alleged importation of yellow fever, and the doctrine of contagion, advocated recently, as being proved by the events of that period.

In 1823, the Committee* of the House of Representatives on quarantine laws

*F. Grima, Esq., was chairman of the committee.

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 the Bayou St. John.

The report of the Board of Health to the Legislature, dated January 15th, 1823, brief, dogmatic, and unsatisfactory, holds the following language concerning the epidemic of the preceding year, (1822):

"The researches made by the board at the commencement of the late epidemic, lead them to believe that the yellow fever *was imported* towards the end of August last, by a vessel from Pensacola, arrived at the basin of Canal Carondelet; and attention was first attracted to the disease in a family by the name of Lynch, passengers in said vessel. This family, of which every member but one fell victims to the yellow fever, had removed to Bienville street, when the disease first spread, aud from here extended through the city."

"The Board of Health believe it their duty to do away with the impression made by interested persons, to induce a belief in the inutility of the powers which you have so wisely conferred on the board, for the establishment of quarantines, which these persons wish to see destroyed." * * * *

"This opinion is diametrically opposed to that of the Board of Health, who believe that the yellow fever is contagious, and that the establishment of quarantines is necessary to prevent its iutroduction." * * * *

"The unacclimated were the sole victims of this scourge."

The Legislature says that the city was perfectly healthy until the month of September—the Board says until the close of August, when the Lynch family having arrived from Pensacola, communicated the disease to the inhabitants of Bienville street, and thence to the whole city.

Truth is one—error legion This same Board the previous year, in an official manifesto, dated September 4th*, gave a very different account of the origin of this epidemic, charging the disease to the sun, the weather. and fatigue, and never so much as hinting that the poor Lynches had introduced contagion iuto the city, which latter, saving five yellow fever deaths, "never was more healthy." The Board testifies to the "*strictness of the measures*" (or quarantine then existing) "will check its progress."

This document is a melancholy proof of the inconsistent and contradictory opinions and actions of men unwilling to relinquish power, who resort to the sun, &c., to account for the origin of the fever; then they fly to contagion; now misleading the public by stating that there are but five cases having "the usual symptoms," and then, saying that their "*strict measures will check its progress*,"—thereby jeopardizing the lives of a whole city upon the supposition of the contagiousness of the disease! What can be more criminal in a Board of Health, whether its

* See the sequel.

members believe in the contagious, or local origin of yellow fever, than the suppression of truth, except it be the promulgation of *falsehood?* Seclusion in the one case, if contagion be true, and flight in the other, if the fever be of local origin, might have saved hundreds of lives, if adopted early enough. The late Dr. Townsend, of New York, a consistent contagionist, in a work on yellow fever, published in 1823, avers that facts known in that city "show that the disease actually prevailed in New Orleans *at least a month anterior to this meeting of the Board of Health.*" (313.) He says "that from information derived from various sources which may be fully relied on, yellow fever broke out in New Orleans as early as the *beginning or middle of July.*"

This document * of the New Orleans Board of Health, subjoined in a foot note, is given *in extenso*; inasmuch as it ignores the Lynch family, and confirms the report in the Legislature as to the *strictness* of quarantine, now doubted after a lapse of thirty years. The exposition of the Board subsequently adopted, asserting the importation of contagion by the Lynches, is virtually contradicted by facts recorded in the Official Report of the Army by the Surgeon General, published in 1840, from reports of Medical officers. Surgeon McMahon, himself a sufferer from yellow fever, at Pensacola, in 1822, says "that on the 7th of August, a young lady, who had recently arrived from New Orleans, died with the black vomit. Her attending physicians, Drs. Elliott and Bronaugh, had no suspicion of the real character of the disease, until this last harbinger of death made its appearance." Five days afterwards two died: "between the 13th and 20th," says the doctor, "upwards of thirty deaths took place. The disease now spread rrpidly. Out of a population of 1000 souls, upwards of 200 have already become its victims. On the 26th the troops evacuated the town. Up to this period their health remained unusually good.* * * Among its first victims was Dr. Elliott, an officer whose loss cannot be too much regretted."

Now all the parade of the Lynch family as having been the importers of yellow fever contagion is perfectly futile, as it would be to argue importation by the young lady just from New Orleans; both of these arrivals were coincidences, not causes of the two great epidemics. During 1821, the year before the arrival of the Lynches, seven persons affected with the yellow fever entered the Charity Hospital —and in the two preceding years the number was much greater—for 1820, eighty-two, and for 1819 seventy-one—enough, surely, without the Lynches.

* Board of Health, New Orleans, September 4, 1822.—"At a meeting of the Board on Tuesday, the 3d of Sept., 1822, the following address was adopted and ordered to be published:

"It becomes the duty of the Board of Health to state to the public, that five cases of fever have lately occurred, in which all the symptoms which are usually exhibited in the yellow fever, were observed. It is hoped, from the favorable state of the weather, that the disorder will not spread, as it has not occurred except in persons who had undergone great exposure to fatigue, and had been much exposed to the sun. The precautions taken to render more strict the measures adopted to prevent all communication between this city and the places abroad and in the vicinity where the disease prevails, will check its progress. This hope is more confidently indulged from the circumstances of no new cases having been reported to the Board as having originated within the last two days. With the exceptions noticed above, the city never has been more healthy, and it is believed that the mortality during the last three months has not much exceeded that which took place during the three months preceding them.

"I certify the foregoing to be a true copy from the minutes. H. K. GADON, Secretary."

Although it has been said that no admissions for yellow fever took place in 1821, when quarantine prevailed, yet I have found, as above stated, seven admissions: M. Burns, January 1st, recovered; J. Gildon, January 3d, died 10th; B. Johnson, March 3d, died with black vomit ten hours after; L. Omeline, June 14th, cured; J. Henderson, June 18th, cured; John McCarty, June 20th, cured; J. P. Jacob, August 7th, died next day.

Dr. Davidson, himself a quarantinist, gave the following account of Jacob's case at a meeting of the Board of Health, August 10th, 1821, as reported in "The Friend of the Laws":

"Case of J Jacobs, reported by Dr. Davidson, on the part of the Board: The symptoms and its fatal termination on the fifth day, together with the appearances observed on examination of the body after death, presented strong evidences of its near approach to yellow fever; J. J. was a stranger to the climate, and had been exposed to the heat of a burning sun and hard labor for the last three weeks on a raft of logs on the bank of the river."

The records of the hospital, and these somewhat reluctant admissions of the doctor, are conclusive. Now I could offer a list of yellow fever cases admitted into the Charity Hospital for every year since its records began, taken after a most careful examination of the same, not excepting that most salubrious year 1821, which preceded the advent of the Lynches in New Orleans, in which quarantine was established. As the continuity is unbroken, there is no need in the world that the Lynch family should arrive—others having had the yellow fever sufficiently to furnish contagion enough for the whole city every year. There was no logical connection between the Lynch family and the epidemic of 1822. Had the family never visited the city, all the previous and subsequent analogy goes to show that a number of cases, if not an epidemic, would have occurred just as in other years, and about the same season—just as an epidemic occurred in 1822 at New York, Augustine and many other places in both hemispheres.

This alleged importation, so fruitful a theme with the contagionists of 1822, and of the present period, is completely disproved by Dr. Heustis' work on Epidemic Fevers, published in Cahawba, Alabama, in 1825. At page 421, he says, in his account of the yellow fever at Pensacola, in 1822, before the arrival of the young lady from New Orleans, above mentioned, that "it was pretended by the advocates of imported contagion that the fever was brought in a vessel which arrived from New Orleans about the beginning of August. The captain of this vessel was among the first that sickened and died of the malignant fever; and this after his arrival in Pensacola." Dr. Heustis expressly states that the young lady from New Orleans arrived subsequently to the captain! Dr. Heustis, also, maintains in view of all these events, that it would not be "reasonable for the advocates of quarantine laws to suppose that where those salutary regulations are *so strictly enforced as they are in New Orleans*, that the disease could be imported from that Eden of health. The opinion of one of the most respectable physicians in Pensacola, was, that the disease originated entirely from local causes. Such also was the conviction of the Board of Health."

Although the present investigation is not intended to be history of yellow fever anterior to its invasion of New Orleans, it may not be improper to remark that this disease appeared in Pensacola in 1765, when, and where a British regiment lost one hundred and twenty men, and eleven out of twelve ladies by yellow fever. (Lind on climates, 119.)

Dr. Townsend of New York, upon the authority of Mr. Barber, of Pensacola' and the public journals, states that the population of Pensacola, which was one thousand, was reduced by flight on the breaking out of the epidemic to four hundred, out of which number two hundred and eighty died of the fever. (249-50.)

The logic of 1822, founded on equivocal facts, weak then, still more diluted now by the stream of time for thirty years, can have little potency.

While the facts, arguments and quarantine operations were still fresh, the public felt convinced of the evil of this system of yellow fever prevention, and determined to petition the Legislature to abolish the quarantine laws: accordingly,

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 Legislature, however, took no decisive action upon the matter. The quartine continued in force. The health of the city was good.

Probably in no year since the first irruption of yellow fever in New Orleans were the eases of this disease so few as in 1823, two cases only having been recorded in the books of the Charity Hospital: James Holden, Irishman, admitted September 11th, and died two days after with black vomit; John Hall, aged seventeen, born in Maryland, last from Red River, admitted August 23, concerning whom, I found the following record: "A well-marked case of yellow fever removed to the hospital with black vomit, taken out of a flat boat, laden with hogs, at the mouth of the Red River, by the steamboat Eagle"—recovered.

The yellow fever prevailed in August and September at Port du Passage, 1823.
"seven leagues east of Bayonne—one of the finest ports in Europe—well fortified by nature and art, and covered towards the land by high mountains and rocks, communicating with the sea by a small passage between two rocks, affording passage but to one vessel"—a locality represented to be unsurpassed for general salubrity. (Dr. Jourdain.)

Natchez, says Dr. Monette, was more severely visited than any other city of 1823.
its population, 320 having died of yellow fever. Dr. Cartwright,* then of Natchez, now of New Orleans, and Dr., now Professor Merrill, of Memphis Medical College, gave highly interesting histories in the Medical Recorder, and in the Philadelphia Journal of Medical Sciences, concerning a great epidemic at Natcehz in 1823, which the latter affirms "took place under circumstances that wholly precluded the possibility of its importation."

"The town of Washington, six miles distant," says Dr. Cartwright, "was crowded with citizens, the sick and the dying who fled to it, yet in no instance did the inhabitants of Washington take the yellow fever unless they had breathed the atmosphere of Natchez. A daily and free intercourse was constantly kept up be-

* Dr. afterward Professor Calhoun, pronounced Dr. Cartwright's paper on this epidemic "the most interesting paper ever submitted to the public." (See Amer. Med. Recorder.)

tween the two places. It was two weeks after the flight of the inhabitants of the city, before Natchez under the hill was attacked."

At Fort Smith, Arkansas, 35° 22′ N. lat., "yellow fever of a high grade prevailed," without a suspicion of exposure to contagion. (Off. Rep. Army U. S.)

New Orleans never had been more healthy for a quarter of a century—a circumstance upon which the Governor congratulated the Legislature in his message of January, 1824, in which he proclaims that New Orleans was free from "*all contagious diseases.*" But January differs from September, as the sequel will show.

In his message, dated Sept. 11th, 1824, Mayor J. Roffignac gives the following exposition of the causes of yellow fever, in which contagion has no place, without alluding to quarantine, which was then in force, and which had afforded no protection; he proceeds to enumerate measures that have at least the advantage of being comprehensible and useful in an economical as well as in a sanitary point of view:

"The opinion of professional men on the primary causes ot the insalubrity of New Orleans, tends only to confirm the idea which must occur to the mind of every attentive observer, on looking at the topographical situation of our city, to wit:—that those causes are of two kinds; the one arising within, and the other without the city itself, and that both ought to be counteracted.

"The internal causes are, 1st. The filth daily created in a populous city. 2dly. The low grounds and pools where stagnant water lies, the wooden gutters, constantly wet and fermenting under the rays of a torrid sun. 3dly. The want of privies in most of the populous districts, which renders it necessary to recur to the disgusting and dangerous use of tubs.

"The external causes are, 1st. The marshes lying North and West of the city, uncovered but undrained, and deprived, by the cutting down of trees, of the shelter formerly afforded to them by the shade of a luxuriant vegetation for which the very miasms that now spread death and desolation among us, were a source of life and vigor. 2dly. To the South and East, the Mississippi, which in its periodical retreat, at the hottest season of the year, leaves on its banks a great portion of the filth, which has been thrown into the current, but is brought back by eddies. 3dly. The winds, which at the moment we feel most secure, may, as was the case in 1822, convey to us the deadly effluvia of the dangerous spots which they sweep in their course. Such are, gentlemen, &c."

On the 15th of November, of this same year, the Governor in his message to the Legislature, notwithstanding his exultations at the beginning of the year at the exemption of New Orleans from *contagious diseases*, says, "New Orleans has been again subjected to the dreadful scourge," and suggests the expediency of closing the business season in midsummer, and recommends a general flight to the unacclimated.

The quarantine had been tried for three years, and yet two epidemics had occurred. The contagionists began to waver, and the joint committee of both houses of the Legislature, disagreeing on quarantine, were discharged from the consideration of the same on the last day of November, 1824.

Experience which is ever opposed to false theory convinced the public that quarantine was not only useless but supremely mischeivous in a city so exclusively commercial that a free, untrammeled trade, with freedom of ingress, egress and progress is not simply useful only, but a social necessity, involving the question of subsistence or starvation. Accordingly on the 19th of February, 1825, the Legislature repealed the quarantine laws which it had enacted just four years previously—at the same time the quarantine grounds were directed to be sold. During the eight years that followed, without quarantine, the yellow fever diminished. It never equalled that which took place under the strict quarantine of 1822, when according to some authorities 2,000 * died of that malady, although the records which I have examined, show only 808—a number sufficiently appalling in the comparatively small population then resident in the city, especially during the hot season; the whole reported mortality for the three months ending with October being 1,362. The ratio of mortality in the Charity Hospital was enormous—out of 349 admissions, 239 deaths, and only 98 cures took place. The maximum mortality upon one day rose to 80—of yellow fever to 60.

In New York yellow fever carried off 243, out of 414, the number attacked. 1822. New York.

CHAPTER V.

GEOGRAPHICAL TABLEAU OF YELLOW FEVER IN 1853.

The geographical area of yellow fever in 1853, compared with former invasions, was greatly extended, including Florida, Alabama, Louisiana, Mississippi. Arkansas and Texas—six States of the Union of vast territorial expansion, consisting of alluvial, diluvial, and tertiary formations, valleys, dry prairies, elevated plateaux, irregular terraces, low undulating hills and bluffs, and pine woods, interspersed with bayous, lakes, shallow basins, shaking prairies, large bays, dense cypress swamps, cane brakes, colossal grasses, inundated plains—a region undisturbed by volcanic action, where the geological or telluric causes of disease, if such be really regarded as causes, must be nearly uniform. Of these States five are washed by the almost tideless Gulf of Mexico, presenting a vast depressed, marshy, sandy, shelly, rockless littoral, which curves from the Rio del Norte to the peninsula of Florida, deeply indenting the temperate, yet approaching the torrid zone, having low outlying islands in front, and numerous great rivers flowing through the back ground, bringing detrital matter from the high lands and primitive formations of several mountain chains, with tertiary limestones and coral reefs trending along its eastern portion upon the Floridian peninsula. 1853. Geological tableau.

As immense importance has always been attached to the topography of yellow fever, which has been generally attributed to swamp-exhalation, it will be necessary to take a closer view.

The elevated zone called the bluffs, a broken diluvial plateau, touching the Lakes Pontchartrain and Maurepas on the South, where it is most depressed, running north between the Pearl and Mississippi rivers; the eastern shore of the latter for hundreds of miles, with some interruptions, is overlooked by these impending terraces, which sustain forests of colossal magnolias, pines, oaks, liquidambers, &c.—a platform which sundry learned medical writers have indicated as a secure retreat from yellow fever, although neither the past nor the present justify this theoretical view. The epidemic of 1853 raged fully as much in this region as in the most depressed plains among the vast cypress swamps and salt water marshes of littoral Louisiana.

* The Rev. Timothy Flint who was in New Orleans in 1823, estimates the mortality at 2,000.

The epidemic was most fatal in this region, from its Southern border upon the Northern shore of Lake Pontchartrain at Madisonville, Mandeville, Louisburg and Covington, to the higher lands of Baton Rouge, Clinton, Port Hudson, Jackson, Bayou Sara, St. Francisville, Fort Adams, Natchez, Grand Gulf, Yazoo and Vicksburg, not sparing the little villages of the piny forests.

Topography. Thus the towns of Louisiana, Alabama, and Mississippi States, elevated from 20 to 400 feet, and more, situated on the tertiary formation, often in the pine lands, remote from swamps, being high, dry, and clean, suffered more, in many instances, than New Orleans situated, as it is, upon the recent alluvium or newer Pliocene, touching the river in front and dipping into the stagnant swamps of the cypress basin in the rear, and intersected everywhere with filthy gutters, sewers, ditches or canals. The elevated zone of pine woods in Northern Louisiana, and elsewhere in the adjoining States, forms s striking contrast to the depressed plains, cypress basins, and marshes of the Southern delta. The epidemic of 1853, like previous ones, goes to prove that marsh-miasma is not the specific cause of yellow fever, as is generally supposed. The very towns which the lamented Drake recently designated, on theoretical grounds, as safe retreats from yellow fever, have suffered most from it.

This topographical sketch of yellow fever will be concluded by a slight outline of a few towns where it appeared in 1853—some in elevated, some in depressed situations, taken almost at random from a multitude, omitting those of Texas altogether.

1853. Pensacola. The epidemic appeared at Pensacola: 30° 29′ N. lat.; elevated 40 to 50 feet—with rising grounds in the rear, the sea before, and dry white sands beneath it, (founded in 1699). This town has for nearly a century been occasionally visited by yellow fever and sometimes nearly depopulated.

Yazoo. The city of Yazoo, "dry, elevated and beautiful," 32° 40′, N. lat., "was shrouded in gloom, sorrow and mourning by this never to be forgotten pestilence." By the first week in October, 150 had died of the disease, which was still progressing—a large mortality for its reduced population.

Baton Rouge. Baton Rouge, 30° 36′, N. lat., 135 miles above New Orleans, on high ground, with a population of 2000 greatly reduced by flight, was, early in November, reported officially to have lost 202 by the epidemic.

Shreveport. In Shreveport, 600 or 700 miles from New Orleans, on the Red River, the epidemic beginning in September, declined early in November, but reappeared towards the end of that month, and still continuing to December, having destroyed about one-fourth of the population, judging from the newspapers and from the verbal statements of visitors from that town. Up to the 2d of September, 165 fatal cases had been reported.

Thibedeaux. In Thibodaux in about one month ending on the 24th of September, the deaths from yellow fever amounted to 147, or 15 per cent. of the resident population, as reported in the papers; but Dr. McKinley, a practitioner in the town, informed me that not more than 500 persons remained during the epidemic, and of these 160 died—more than one-third.

Fort Adams. About two hundred miles above New Orleans, upon the steep declivities of the hills which border the eastern bank of the Mississippi river, stands the town of Fort Adams, which in former years, as well as in 1853, was visited with yellow fever, as were the neighboring plantations upon the hills.

Natchitoches, 31° 46′ N. lat., one of the oldest towns of Louisiana, more than four hundred miles from New Orleans, on Red River, "beautifully situated on a well developed river bank, extending back to a pine bluff, with fine scenery around it," suffered and still suffers severely, at the latest dates. Natchitoches.

The village of Lake Providence, in a population of two hundred, is reported to have lost one hundred and twenty from yellow fever. Providence.

At Alexandria, the disease became epidemic about the middle of September. It declined towards the end of November, but was not wholly extinguished at the latest dates. The disease is reported to have carred off from one-fifth to one-sixth of the population. The heavy frosts at the close of October and beginning of November, did not appear to have had any marked influence upon the epidemic. Alexandria.

From this imperfect geographical enumeration, it is evident that *altitude* did not modify the epidemic of 1853. The general opinion that yellow fever appears only in depressed places, or marshy plains, is contradicted by innumerable facts in America and in Europe.

The report on quarantine and yellow fever by the British Government for 1852, enumerates ninety-six cities, towns and villages in Spain, wherein yellow fever has prevailed in this century. Many of these places are far inland, high, dry, rocky and hilly, and among mountains. Ximena on a hill; Chipiona on a rock; Medina Sidonia on a high hill; Los Barrios in the mountains; Xerez on a hill; Arcos de la Frontera on a very high rock; Utrera, between two hills; Carmana on a hill; Moron at the foot of a chain of mountains; Granada 927 feet high, near the Sierra Nevada mountains, thirty-one miles from the sea; Ronda in the midst of a range of mountains at a very great elevation.

The medical geography and yellow fever mortality of Gibraltar, as forming the strongest contrast to New Orleans, and as contradicting the marsh-theory of yellow fever, deserve a slight notice: Gibraltar, a compact, gray, marble promontory, three miles long, seven in circumferance, an area of 400 acres, covered in few places with earth, rising 1,500 feet above the sea which washes its almost inaccessible walls, having had a population of 15,000 in 1804, lost out of this number in a few weeks 5,733 souls from yellow fever, or nearly two in five. Canal Carondelet.

Without the remotest wish to add another to the many futile expositions of the specific cause of yellow fever, I may be allowed to refer to two coincidents which attended the first and last epidemic irruptions of this disease in New Orleans. The original Basin of Canal Carondelet was excavated in 1796; the capacious Basin now being excavated for the same Canal, about a mile from the city and from the former, was to a great extent dug out just before the epidemic. Frequent visits to this spot with the view to its geological character, gave me opportunities of noticing whatsoever transpired in that district in the spring, before the epidemic appeared. The laborers, nearly all Irish, enjoyed very good health, although the emanations from the Bayou, where the scene of labor lay below the terminus of the old Canal, were most offensive. The water was so impure that many of the fish were killed, adding to the offensive effluvia. This, however, was attributed, not so much to the filth from the streets, as to the deleterious refuse matters from the gas-works of the city. 1796. 1853.

In the New Orleans Directory for 1852, I gave a summary of my researches, based on documentary, traditional and living testimony, showing that in both the Jail.

old calaboose and new prison, yellow fever had never prevailed, even during epidemics, although no means had been adopted, as quarantine, fumigations and seclusions, to prevent the introduction of the supposed contagion of yellow fever. The conclusion drawn upon that occasion is thus cautiously expressed: "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." Failed it has, during the far-reaching epidemic of 1853, but the failure has been so limited that the general rule is not yet invalidated. Through the politeness of my friend, Dr. Cartwright, I have received a document copied from the jail record, from which it appears that the average number of prisoners in the Parish Prison from June 2d to October 4th was 170, a large portion unacclimated; among whom twenty-two were attacked with yellow fever and six died, two having had black vomit. Twelve of these prisoners were admitted after the 11th of May, anterior to which several cases of yellow fever had appeared in the city, as it has been asserted. Four of these prisoners were admitted in May, one in June, three in July, two in August, two in September, and all but three had been admitted during the year 1853. Now if twenty be deducted for the acclimated, the residue 150, if they had been at large, exposed to the sun, dissipation, &c., would probably have lost fifty of their number, belonging, as they did, to the reckless class.

1852-3. From the same gentleman I learn that the records of the jail show there was but one death more in 1853 in the jail than in 1852, among the same average number of prisoners, and for the corresponding period of the year.

Frost. About the 25th of October a white frost appeared, for a few nights, at many of the interior towns of Louisiana, which was received as the harbinger of returning health, but which did not, in a marked degree, arrest the march of the epidemic. Warm weather, however, soon returned, and has continued to the present (the third week of December;) but this did not revive the epidemic in places where it had declined, as in New Orleans and many other places.

Clinton. In the town of Clinton, in the parish of West Feliciana, lying between the Mississippi and Pearl rivers, 100 miles Northwest from New Orleans, the epidemic began about one month before this frost, but at the latest dates (December 10th) it had not yet disappeared—75 having died out of 350 or 400 who did not fly from the town as did about 1,000 persons. Several blacks died.

In places where the epidemic had steadily and greatly declined, the return of absentees, and the influx of strangers did not reproduce the epidemic, as was generally expected. The arrival of absentees, mariners, steamboatmen and immigrants, amounting to about 50,000 in New Orleans, did not, in any appreciable degree, affect the ratio of declination. The mortality, from yellow fever, officially announced for the week ending December 18th, 1853, being three, discloses a fact of supreme significance against the contagiousness of this disease, inasmuch as the city is, if any city can be, reeking with contagion.

CHAPTER VI.

MORTUARY TABLEAU OF NEW ORLEANS AND MOBILE DURING THE EPIDEMIC OF 1853.

The population of New Orleans when the epidemic broke out is estimated at 150,000, or 4,541 more than that of the city census of the year 1852, which gave a total of 145,483. It is probable that 30,000 left the city, whereby the population remaining was reduced to 120,000, including 30,000 or 40,000 that had never passed through an epidemic, and perhaps many thousands that had passed untouched through the epidemic of 1847—some of whom suffered in 1853—an enumeration, however, merely proximate, without any certain basis. 1853. Population.

As the epidemic increased the mortality from other causes was little affected, particularly after the month of July. For five months ending June 25th, the average weekly mortality from yellow fever was about 4—from other diseases 116; the next five weeks gave an average for yellow fever of 280 per week—other diseases 160. The next four weeks ending August 28th, gave a yellow fever average mortality of 1,211 per week, or by weeks respectively, 967, 1,288, 1,346, 1,243—aggregate 4,844; while for the same time the average from other causes was 157—not including an average weekly mortality of 71, reported as deaths from causes unknown, and generallly supposed to have been deaths from yellow fever. During the next four weeks ending September 28th, the average weekly deaths from yellow fever was nearly 200, while for the same time the average from other known causes gave 65, and deaths from unknown causes a fraction over 16. Numerical analysis.

From the last week in May, when the weekly mortality was for yellow fever 1, and for all other diseeses 139, the non-yellow fever mortality vibrated but little until after the week ending the 23d of July. having ranged from its maximum 158, for the week ending 25th of July to its minimum 129, for the week ending July 9th, but for the week ending July 23d it rose to 188; the next week it reached its maximum for the season, that is 192, at which time the epidemic was rapidly increasing, 1,409 having died, 1,121 in the two preceding, and 1,325 in the three preceding weeks. About the 9th of July the epidemic, as such, began, so that the ratio of mortality from causes other than yellow fever, was not much disturbed during the greatest fury of the epidemic until the week ending September 4th, after which it declined to 102; but for the next week it rose to 120, nine less than on the 9th of July, when the epidemic appeared, and 19 less than the week ending May 28th, when the first death from yellow fever was reported. In the week ending the 21st of August, which gave the maximum of deaths from yellow fever, that is 1,346, the mortality from other diseases was but 152, exactly the same as for the week ending July 2d, when, as yet, all the deaths from yellow fever beginning with May, were but 47. So that the ratio of mortality, independent of the yellow fever element during its unparalleled prolongation, was but little changed except during the last two precursory weeks of July. Thus the epidemic caused but a slight oscillation among other maladies, while its pestilential waves rolled over the devoted city.

If the epidemic be considered in a larger view, by months, it will be seen that its collateral influence is scarcely manifest. Mortality from causes other than yellow fever, for June, 581; for July, 559; from yellow fever for June, 40; for July, 1,406, not including 45 for the former month, and 112 for the latter, under the head of unknown or "not stated."

In August, the two days in which the mortality from the epidemic was least, were the 1st, 106, and the 31st, 95; the decline in September was gradual from the 2d, 102, to the 30th, 9. The progressive decline, with some fluctuations, continued throughout October and November.

The greatest number of deaths in any one day, 283, of which 239 were from yellow fever, occurred on the 22d of August. The greatest number of deaths from the fever, in any one month, was in August, amounting to 5,189, or by adding the unknown, 5,242; by adding all the deaths 6,235; an average exceeding 201 per day; about 9 every hour; one every six or seven minutes! for a whole month!!

1853. Mobile. Mobile: Here the epidemic began early in August, reached its maximum mortality in the first week or ten days of September; the deaths from yellow fever for the week ending the 9th day of that month reached 194, which, added to the mortality from other causes gave 241, a fraction less than 35, as the average of each day; during the second week the mortality began to decline slightly; in the last week the deaths from yellow fever had decreased more than two-thirds; the decline was progressive throughout October; on the 26th of this month the aggregate mortality from the first of August amounted to 1,256, of which 889 were from yellow fever according to the official report; but of the number reported as dying from causes unknown, it was supposed that half were from yellow fever, which will give a yellow fever aggregate of 1,072 without counting sporadic fatal cases which occurred subsequently. The average number of deaths for each of these eighty-seven epidemic days, is a fraction less than 15. With the increase of mortality from yellow fever, an increase of mortality from other causes took place also during this period.

The epidemic in Mobile beginning more than a month later than in New Orleans, reached its culminating point three weeks later. Of shorter duration in Mobile, its proportional mortality was larger than in New Orleans, a fact that applies to nearly all the towns which the epidemic visited.

Aritmetical Tableau of the Mortality in New Orleans, in 1853, from May 26th to October 22d.

Period 1—May 26–31—Sporadic.	
Total	110
Yellow Fever	3
Other Diseases	97
Diseases not stated	10
Period 2—June—Epidemic Inception.	
Total	666
Yellow Fever	40
Other Diseases	581
Not stated	45
Period 3—July—Epidemic Increment.	
Total	2,077
Yellow Fever	1,406
Other Diseases	559
Not stated	112
Period 4—Aug.—Epidemic Culmination.	
Total	6,235
Yellow Fever	5,189
Other Diseases	689
Not stated	357
Discrepancy	29
Period 5—September—Epidemic Decrement.	
Total	1,565
Yellow Fever	485
Other Diseases	961
Not stated	88
October 22.	
Total	503
Yellow Fever	139
Other Diseases	310
Not stated	57
Discrepancy	3

RESULT.

Total Mortality for 149 days*	11,156
Total Miscellaneous Diseases	2,697
Total Yellow Fever	7,782
Total unnamed (mostly yellow fever)	669

*Mr. Maginnis' "List of Interments" begins twenty-six days earlier, and ends eight days later than the enumerations which I have compiled. His aggregate exceeds the above by nearly one

By adding the two latter, the aggregate mortality from yellow fever will be 8,451, or by deducting one-third from the unnamed diseases, 8,228, without enumerating deaths from yellow fever, from October 22d to December 22d.

In these totals the discrepancies are reduced from 32 to 8. The whole mortality from yellow fever is estimated, in round numbers, at 8,400 for the year 1853.

The maximum mortality of the yellow fever of 1853 arrived sooner in the season than usual, and is more truely represented by that of the plague in London, in 1665; namely—June 590 deaths, July 4,129, August 20,046, September 26,230, October 14,373, November 3,449; total 68,817.

According to the report of the Howard Association, published late in December, the society had under its care during the epidemic of 1853, no less than 11,088 yellow fever patients—5,203 males, 5,885 females—of whom 2,942 died, and 8,146 were cured. Expenditure, $159,190 32. Average for each patient about fourteen and a third dollars. Of this number (5,845) much more than half were Irish; German, (2,890) nearly a quarter; French, 436; United States (716) less than one in sixteen of the whole. Hence, it appears that Ireland and Germany give 8,735; other countries 2,353. Howard Association.

The Association, during the epidemic, received from all parts of the Republic the sum of $228,927 46; more, indeed, than they had need of, leaving a large surplus to be put out at interest for this charity.

Omitting Spain and the United States, the yellow fever zone contributed but nineteen; the plague zone of the east, as Palestine, and Greece, but seven to this formidable aggregate of 11,088.

The predominance of female patients in the above enumeration is remarkable, in as much as that sex is the least susceptible to the yellow fever, and contribute to the mortality from this disease in a ratio greatly inferior to males. The most probable explanation is this—females preferred the Howard hospitals to the Charity hospital and the city hospitals, established by the Board of Health. Mortality of the sexes.

In order to ascertain approximatively the proportion between the mortality of the sexes, I selected the first day of August, counting all the interments from fever, as distributed among the letters of the alphabet, and among the following cemeteries, in Mr. Maginnis' "List of Interments:"

	Males.	*Females*		*Males.*	*Females.*
Cypress Grove No 2	8	2	Lafayette	24	11
Protestant	1	1	St. Patrick's	15	10
Charity Hospital	21	9	St. Vincent	13	8
Total				82	41

Hence, it appears that the mortality of females, is, for 1853, exactly half as great as that of males. This high ratio of female mortality is, however, one of the most extraordinary features of the late epidemic. Of 1,450, who died of yellow fever in August, September and October, 1841, but 220 were females, or nearly one in seven. The ratio of mortality among children will probably be found enormously high from fever in 1853, compared with preceeding years. This will appear obvious by Mr. Maginnis' list, compared with the following extensive analysis of the epidemic of 1841; thus—I made thirty-three series, each consisting of thirty persons; I then took the youngest one in each series, (among these 990 dead) which Children of 1853—1841.

thousand, (995) and is doubtlessly as accurate as the crude materials would allow. This document will afford grave-yard arithmeticians facts worthy of extended analysis as to ages, sexes, and so forth.

gave these ages: 15—17—17—2—5—20—19—16—20—17—15—17—18—19—8—2—7—18—18—19—8—6—8—2—15—3—18—14—2—18—3—5—19. Scarcely an infant in the whole series!

In order to test, approximatively, the ratio of infantile deaths from fever, I counted the ages of all fever victims who were interred in the following cemeteries, 1853. on the 10th of August, namely, Cypress Grove, No. 1 and No. 2, and St. Patrick's, amounting to eighty-nine known ages, and two called "infants," (say ninety-one) among which were two aged 2; one aged 3; one 4; which with the two infants, make six out of ninety one—a result which could not have been anticipated from the history of anterior epidemics, as the very young and very old, as well as women and negroes, had always suffered less than other classes.

CHAPTER VII.

NUMERICAL TABLEAU OF CREOLE MORTALITY IN 1853 FROM YELLOW FEVER.

Mr. Maginnis on Interments in N. Orleans. The proprietor of the True Delta, Mr. Maginnis, having made the necessary arrangements early in the epidemic of 1853, to obtain a correct list of all the deaths (12,151) in New Orleans for the six months ending with the first of November, and having published the same early in December, showing the name, age, place of nativity, disease and date of interment, compiled at length from the physicians' certificates and other documents, I beg leave to offer some numerical reasonings based on this valuable document, particularly with the view of illustrating the disputed question, whether Creoles enjoy immunity from yellow fever or not? Whether Creoles die, and in what proportion? The method I have adopted is as fair as can be conceived, and will give in this particular, a compendious view. I selected the two first weeks of August, the middle of the epidemic, as distributed among the twelve cemeteries, and among the different letters of the alphabet, counting all the persons who died of fevers of what kind soever, as the list does not distinguish the fevers—the one from the other—an arrangement the most unfortunate for the merits of the Creole question, because, in any case it will be admitted that Creoles would be more likely to die of any other fever than yellow fever. It will be provisionally assumed that all the deaths marked "*fever*" were from yellow fever alone. The whole number of deaths during this period among natives of New Orleans is but 21—of this number one was aged five, and two aged seven days; two aged two; one aged three, and one ten months; one aged one—three aged two—one aged four—one aged five, and two aged nine years. In one case the word "child," in another "infant," are used to denote the age, and in two cases the ages are omitted. Omitting the two infants and the two of unknown ages, probably infants, the average of the remaining seventeen is twenty-six months, or by omitting the two highest ages, the average age will be less than fifteen months. The list here referred to shows that these twenty-one children are all that died of fevers of every kind among all classes of population during fourteen days in the midst of the epidemic. For the sake of illustrating the argument, the least favorable to creolization, as before intimated, let it be assumed that these all died of yellow fever, though there can be little doubt that the whole number were born of unacclimated parents—parents who had not been creolized either by birth or long continuous residence in the city. Even the two aged nine years each, probably were born of

Immunity. Method. Numerical analysis.

parents only temporarily resident in the city during the cooler season of the year, whose summer residences are in the country; or they may have been born of parents who lived here nine years ago, as immigrants or visitors, and who had returned to New Orleans. But let it be admitted that both of these children were born of parents constantly resident for ten years—admit that these children had not been sent from the city to the country, or to the North among relatives, to school, &c.' then let these two Creoles be compared with the whole number of deaths from yel-low fever, and what will be the result, supposing that they did die of yellow fever and not from some other fever? The whole number of deaths during these two weeks, as taken from the official daily report of the Board of Health, is 2,702—from yellow fever alone 2,252—from diseases not named, supposed to be yellow fever 114; total deaths from yellow fever 2,369. According to this supposition waiving, for the present, the consideration of former epidemics, one Creole in 1,184 died of yellow fever out of a creolized city population four or five times greater than the non-creolized or strangers.

In order to vary the numerical cousideration, I selected the first week in September, counting the number of deaths among persons who had been born in New Orleans. This was the more desirable, because at that advanced stage of the epi-demic it might be supposed that it would reach persons long resident to a greater extent than in its inception, and, such indeed was the general opinion. Upon examining the alphabetical list as distributed among the twelve cemeteries, nine individuals proved to have been born in New Orleans: one aged two, one three, one seven, one eight years, two aged six months, one eight months, one eighteen months, and one mentioned as an "infant," giving an average age of thirty-four and a half months. This whole number is subject to all the contingencies in the first series; during these seven days the total mortality was 741, of which 560 were from yellow fever, and 33 under the head of "unknown," making 593, leaving 148 for all other diseases. This enumeration does not conflict with, but gives validity to, the explanatien given of the former series.

The St. Louis cemetery No. 1, which represents the wealthy French of the city and of the country, and those immigrating from France, presents the following mortuary tableau for six months, ending with November the first: deaths from all fevers among individuals born in New Orleans, 6: one aged twenty months, four, respectively, 3, 10, 20, and 22 years, and one styled "infant." The explanations previously given apply here. That only six should die of fever in six months, had no epidemic prevailed, is remarkable, in a mortality of two hundred and six. Had all these six deaths been from yellow fever, it does not, in all probability, invalidate creolism in the least. Three were infants, one a girl, and two still young, who probably had not remained continuously in the city, and who, on returning, contracted the disease. St. Louis cemetery No. 1.

The Protestant Cemetery is the best mortuary representative of the wealthy creolized Americans, many of whom, however, could scarcely expect immunity during an epidemic, inasmuch as they leave the city annually, in the summer, and educate their children in the North. The interments from all fevers among the natives of New Orleans in this cemetery, for six months ending November first amount to eight, in a total mortality of four hundred and thirty; one of these is "a child," one aged twenty-two months, three aged two years, one five, one fourteen, and one eighteen years. The latter two were, probably, as usual, truants, who did not stay at home much, if at all, but, having returned, died. Previous ex- Protestant cemetery.

planations will apply here; but, if they be rejected, the mortality from all fevers is, for this cemetery, a little over one for each month.

CypressGrove No. 1. The Cypress Grove Cemetery No. 1, is assimilated in character to that of the Protestant. In the former, the total number of deaths among natives of New Orleans from all fevers in six months, ending November the first, is four—one called "a child," one aged two, and one seven months, and one three years, out of 300 deaths; that is, one native infant died in every two months upon an average.

The worst view of these facts does not overthrow the doctrine of immunity, nor afford much aid to terrorists. The creolized dig but few graves in the swamp cemeteries, and if they were much damaged by yellow fever, these cemeteries would tell it.

Unknown names and nativities. The records of the cemeteries of 1853 disclose the most astonishing facts, significant at once of the rapid and deadly march of the epidemic and of the enormous recent increment of the uncreolized element of the population. How many nameless dead bodies! The place of nativity in nearly two-sevenths of the dead is not known, according to Mr. Maginnis' list! amounting to 3,232! In 1843, among 692 deaths from yellow fever, the nativity of only 132 was unknown, a little over one in six. In 1847, among 2,600 deaths from yellow fever, the place of nativity was unknown in only 238 instances, or one in eleven nearly. Further illustrations are unnecessary. It is evident that both the Creoles and the creolized do not come within the category, "unknown." The name and the place of nativity among these classes could scarcely have been unknown, had yellow fever been fatal among them in 1853, a fact so extraordinary would have excited not only attention, but consternation

CHAPTER VIII.

CREOLISM, URBAN, RURAL AND ACQUIRED.

Creole. The word *Creole* in Northern latitudes is often misapprehended, so as to imply more or less of negro blood.

In Spanish America, Criollos or Creoles, were, in the early days of the colonial governments, the native whites of European extraction; neither the native, Indians, nor native negroes, nor mixtures of the races, were so denominated.

Towards the close of the last, and beginning of the present centuries, Drs. Mosely and Williamson and many others, used the word Creole, as applicable, not only to the whites born in the colonies, but to negro natives also.

"Creole—A native of Spanish America or of the West Indies, descended from European ancestors." (Webster's Dict.)

"Creole—A name given to the descendants of whites born in Mexico, South America and the West Indies; in whom the European blood has been unmixed with that of other races." (Brande's Encyl.)

"Creole.—Nom qu'on donne à un Européen d'origine qui est né dans les colonies." (Dict. L'Acad.)

In Louisiana, every native, be his parentage what it may, is a Creole. They are convertible terms.

Although the word *Creole* in its usual acceptation means a white person, it applies to all races, as Creole negroes; it even applies to the inferior animals, and things; a Creole chicken, egg or cow, is worth nearly twice as much as one from a distant State; while a creolized horse, after considerable risk, becomes better, being larger than a Creole horse. City creolization, whether native or acquired is, a practical distinction in the business of New Orleans.

Creoles of the city and the country. The word Creole is generally used in a sense too latitudinarian for precise statistical investigation. It is the resident city Creole, not the country creole—not the Creole who migrates every summer to New York, London, or Paris, that may hope for as good health as is possible to humanity, while two or three hundred others daily fall victims around him—a definition which excludes a great many called Creoles, and one often forgotten, in writing on the subject of yellow fever. Hence arises many apparent contradictions among authors who use the word in different senses.

In former, still more than in recent times, has this fundamental distinction been overlooked. In a great majority of the works on yellow fever in the West Indies, and even in Louisiana, where Creoles are said to suffer from this disease. the true explanation is, that these persons are *Creoles of the country, not of the city;* or at most, they reside in the latter occasionally, chiefly in the winter, and are, therefore, liable to the disease, though they usually have it in a milder form than strangers, and very rarely die.

Dr. Dufour, MS. In an interesting manuscript on yellow fever by the late Dr. Dufour,* of New Orleans, left in the possession of Mr. Joseph Le Carpentier, copied from the original, in the doctor's hand writing, by Mr. Y. Noel, and kindly presented to me by my friend Mr. Barbot, apothecary, it is asserted by the doctor, that in the epidemic of 1820, as well as in years preceding, many persons, natives of the place, had fallen victims to this malady. He says vaguely enough, "beaucoup de personnes des pays en furent atteintes, particulièrement les jeunes gens:" he treated several of these, two of whom died the same day in the same house, a brother and sister.

A few physicians and others, mostly advocates for the contagiousness of yellow fever, maintain that all the Creoles of New Orleans, not less than strangers, have this disease once during life, for the most part during childhood, and that it proves fatal to many of them. It must be confessed that as yellow fever, with rare exceptions, attacks an individual but once, it approximates in this particular, the law of contagions proper. This sweeping statement, however, is, with few exceptions, erroneous, as may be proved by authentic documents concerning all of the epidemics witnessed by the writer for seventeen years, not excepting the extraordinary one of 1853 itself.

Many escape yellow fever. It will have been remarked by careful observers that many families have been settled in New Orleans for half a life-time without ever having had yellow fever. Indeed, it has been thought by many physicians previous to 1853, that at least one-third of all strangers settling permanently in New Orleans, escaped yellow fever altogether—a ratio, however, which is too high for the year 1853, (it may be safely affirmed) athough many strangers, including entire families, escaped the extraordinary epidemic of 1853.

Nativity. The simple fact of being born in New Orleans is not, in itself, protective Thousands are thus born of uncreolized parents, who pass through the city, as immigrants, or who reside in the city in the winter only. Their return to the city might, in this way, swell the number of the so called Creoles to hundreds every epidemic.

*Traitement de la Fièvre Jaune. Méthode du Docteur Dufour. MS.

If it be conceded that no creolized person of New Orleans ever dies of yellow fever, it will still be difficult to account for the extreme rarity of deaths from yellow fever among individuals who ought to have been born in the city, upon the doctrine of chance or probability. Hence a greater number of victims, among natives, might be anticipated for these reasons.

Immunity. 1841. The exemption of the creolized of the city is a fact which every epidemic has confirmed: for example—take that of 1841, in which 1,800 died; five of whom only were natives of the city; one aged three weeks; three two years, doubtlessly born of non-creolized parents; except one, a doubtful ease, in Lafayette.

1843. In 1843, among six hundred and ninety-two deaths from yellow fever but two are certified as having been born in New Orleans, and these two were proclaimed, in a public journal, to be two errors, by the compiler of the dead list for that year.

Creolization. City creolization, native or acquired, has hitherto carried with it proctection against epedemic fevers of almost every kind, as typhus, congestive, or cold plague, bilious remittent, and even intermittent: the latter, however, is more or less prevalent in the rear of the city, where the cypress swamp and the population meet face to face, contending for possession. Collateral protection. Be the cause what it may, hitherto almost complete immunity, a few sporadic cases of these fevers excepted, has been common to all not new-comers. As this immunity is uniformly indicated by the earlier writers upon Louisiana, before the invasion of yellow fever, the exclusion of the latter, if a possibility, would not in all probability be replaced by the former; indeed, immigrants before 1796, were only subject in a few cases to a slight fever, never mortal, Ante-epidemic era. as I have more than once proved by French writers of undoubted credibility. These authorities have not failed to mention infantile lock-jaw, and a few other dseases of the city and country, which, as they affirm, formed the only exceptions to the extraordinary salubrity of the climate in former times.

Creolism. City creolism is here used as a more precise and restricted term than acclimation, and denotes that immunity from yellow fever, whether transmitted from parents born and resident in the city, or that immunity acquired by long residence, with or without having suffered an attack of the disease; in any case it is for most part hereditary—the exception consisting of a susceptibility to a slight fever as proved in 1853.

City creolization is not peculiar to New Orleans, Mobile, Charleston, Havana, or Vera Cruz; but there are many new Southern towns, or rather new aggregations of new-comers, where its influence is less obvious, certain, and uniform, or places where it may fail altogether.

Exemption. Congenital city creolism, that is, the constitutional modification incidental to the being born of Creole or thoroughly creolized parents, with continuity of city residence, exempts the individual from yellow fever with nearly the same uniformity that vaccination prevents the small pox or the varioloid. The varioloid is, as all know, modified small pox, happening to one who has undergone vaccination, or the small pox previously, the frequency of which is probably as great as the frequency of yellow fever among city Creoles who have never absented themselves for one or more winters in Northern climates.

Rural nativity. Country Creoles: All born beyond the limits of the city are susceptible to yellow fever on coming into the city or into a village when yellow fever prevails. In 1853, yellow fever has, for the first time, perhaps, prevailed to some extent in the rural districts, remote from towns, among isclated persons who had not visited them. But in almost all of these instances the disease prevailed in aggregations of people which are virtually towns, as the plantations where the population is concentrated at one centre, often forming a village of from 100 to 500 or more persons. But in the present state of our knowledge of the prevalence of yellow fever in the rural districs in isolated families, scarcely anything can be pronounced positively as to the extent or frequency of attacks among such as had no connection with towns as visitors. Whether, on the other hand, city Creoles who have removed to the country, who have never resided one or more winters in Northern latitudes, have in any instance suffered an attack in the country, or on returning to New Orleans, is unknown. Second attacks are rare.

Plantation villages.

Rural epidemic.

Creolization in the city, with or without having had yellow fever, is equal as a protection against yellow fever, to congenital or native creolism. This immunity is usually acquired in less than ten years, often in five, but to this rule very many exceptions occurred in the extraordinary or exceptional epidemic of 1853.

City immunity, native or acquired in similar cities, as New Orleans, Charleston, Mobile, Pensacola, Havana, Vera Cruz and other places in the present limited yellow fever zone, is probably identical and mutually protective in all such places, while nativity in cities once in the yellow fever zone in which yellow fever has not been prevalent for many years, as in Baltimore, Philadelphia, New York, Boston, Cadiz, Seville and other places, affords no protection.

Mutual urban immunity.

City creolism both native and acquired is, to a great degree, as before remarked, hereditary or transmissible from parents to children. At least the exceptions to this law are few, and fatal results almost unknown, as may be proved by the bills of mortality, though this is like many other indubitable truths boldly denied, particularly since the decline of the epidemic of 1853—the most mortal, erratic, and extraordinary ever seen in New Orleans. It will have been seen what warrant the terrorists have for denying creolization.

Hereditary immunity.

Setting aside the epidemic (of 1853) and reasoning from what is fully proved by the past—the best expositor of the present—it will be seen what little foundation there is for the utter rejection of creolism and acclimatization, which in former years was rung and is still ringing in the public ear.

That many Creole children had, during the epidemic of 1853, a fever—a slight fever—yellow fever if you please, known as such rather by the co-existence of the epidemic than from any severe symptoms among these children—a slight fever, never yet described, having generally of but one paroxysm, lasting from six hours to one, two, or three days, scarcely ever requiring medication. That a few of these cases acquired an alarming violence and even proved fatal, is most true—most deplorable. It will, no doubt, be found upon a full examination of these fatal cases, that nearly all belong to the following classes and conditions: although born in the city, their actual residence has not been continuous, but has vibrated like a pendulum between the country and the town, between Northern schools and cities and New Orleans; or they have been born of unacclimated parents whose continuous residence has been less than ten years, often not that many months; or they have been born of parents one of whom is not acclimated; or, finally, they have been born while the parents resided temporarily in New Orleans, (constituting a large class) and, hence, called Creoles, who, subsequently having come to the city, fell victims, and, hence, appear in the mortuary certificates as natives of the city.

Creole childhood.

Unknown names and nativities. No one acquainted with New Orleans, as it is, can for a moment believe that the large class of nameless persons included in the mortuary returns, called the unknown, as having died of yellow fever, could have been Creoles or residents for any considerable period. A Creole whose name had never been known would be a phenomenon.

The very gentlemen who contend that the Creoles are no more (one doctor told me that they were less) exempt from yellow fever than strangers, contradict themselves by their own written cirtificates. Figures contradict them. Every list of deaths, including that of 1853, contradicts them. The demon of contradiction can go no further.

CHAPTER IX.

YELLOW FEVER ETHNOGRAPHY—RACES, AFRICAN AND INDIAN.

Negro race. The immunity of the African race from death by yellow fever is a problem unsolved, but of the highest import in physiology and ætiology. Whether this immunity be owing to color, or to an unknown, transmissible and indestructible modification of the constitution originally derived from the climate of Africa, or from anatomical conformation or physiological law, peculiar to the race, is not easy to determine. It does not appear that yellow fever prevails under an African sun; although the epidemic of New Orleans in 1853 came well nigh getting the name "African yellow fever," "African plague"—it was for weeks so called!

Immunity. Although non-creolized negroes are not exempt from yellow fever, yet they suffer little from it, and very rarely die. On the other hand they are the most 1841. liable to suffer from cholera. As an example of the susceptibility of this race, take the year 1841: among 1,800 deaths from yellow fever, there were but three deaths among the blacks, two having been children, or 1 in 600, or 1 in 14,000 of the whole black population.

The same immunity from death in this disease is enjoyed throughout the yellow fever zone by the black race: for example, in the epidemic in Charleston in 1838. 1838, the official report shows that among 538 interments of yellow fever subjects, only seven were blacks, or about 1 in 50, and these were, probably, as usual, not city Creoles. This is, however, an extraordinary mortality compared with the same class in New Orleans.

1853. In order to ascertain the proportional number of deaths from fevers among blacks in 1853, I adopted the following plan, comprehending the six months ending Numerical analysis. November 1st: I analyzed more than the one-fifth of the list of deaths by Mr. Maginnis, beginning with the letter A and ending at D, running through all the twelve cemeteries for the six months. The result is fourteen deaths among blacks from fevers of all kinds; two of whom, a child aged eight days, and one aged ten months, were born in New Orleans; of the residue four are mentioned under the term "child," one aged nine months, and one two years; one nine years; the birth place of the residue, one excepted, unknown. The two born in New Orleans that died aged eight days in the one case, and ten months in the other, were doubtlessly not the children of creolized parents, many of whom are brought from more Northern States and kept here for sale, not only to the citizens of the city, but to planters in the country. Among thousands of these, it would be not surprising that fourteen should die of all kinds of fever in six months, if no epidemic had existed, and if the entire race had been insusceptible to yellow fever. In round numbers the total mortality had been 2,500—that from yellow fever about 2,000—during the period above indicated, in which fourteen blacks, many of whom were infants, died of fevers of all varieties, in a black population of 30,000.* Had these deaths all been from yellow fever, they would not,so far as this worst of epidemics goes, affect the argument that while the black race is susceptible to yellow fever, if born out of the city, death is, from this disease among them, a very rare occurrence; a majority of city practitioners never, perhaps, saw a single fatal case.

The Necropolis of New Orleans represents all the fundamental types, if not every variety of the human races, Caucasian, American, Asian and African—all of which except the latter—become the ready victims of yellow fever, the creolized excepted. I have seen, in the same day, the copper-colored American from the low lands of the Mississippi and the Scandinavian from the icy mountains of Norway, dying of the epidemic. The Indian race is equally susceptible as the white race to yellow fever, although some writers have denied this.† Races. Indians.

Dr. Cartwright, of New Orleans, formerly of Natchez, in his account of yellow fever in the latter city in 1823, published in the Medical Recorder, says "five of the aboriginal inhabitants, belonging to the Choctaw tribe, came into the city during the prevalence of the epidemic, and afterward encamped two miles from the city; four took the disease, three men and one squaw. They were most barbarously burnt, [by themselves as a cure.] The squaw was covered with large ulcers, produced by fire, from the pubis to the chin, and was writhing and groaning by the side of her grave, which the well Indian had dug to put her into, as he had prognosticated her death; but the men bore their pain in sullen silence and with savage fortitude—disdaining to disgrace themselves, as men and warriors, by imitating the groans of the squaw, but applied to their own skins the lighted spunk, nor seemed to feel its corroding fire." Choctaw.

Soon after the discovery of America, indubitable records show that the Indians of St. Domingo and other islands were desolated by the yellow fever.‡ The late Noah Webster has shown that this disease prevailed amon the Indians of New England, in 1618 and in 1746, and at other periods.

CHAPTER X.

METEOROLOGICAL TABLEAU OF THE SUMMER OF 1853.

It is not intended to give the special meteorology of New Orleans during the year 1853. It is impossible to connect the temperature of any locality with yellow fever, so that the appearance of a known degree of heat or rain, will invariably prelude or cause the appearance of that malady. Although the yellow fever zone 1853.

* The total colored population by the city census of 1852 was 29,174.

† T. Y Simonds, M D., in the Charleston Medical Journal, (November, 1851,) says "I have never yet heard of an instance of real yellow fever prevailing among the copper-colored race, or American Indians."

‡ Breton, in his dictionary of the Carib language (1655) explains the Indian word for yellow fever, literally coup de barre, one of the names adopted by Du Testre and others, expressive of the muscular pains of yellow fever, as if produced by blows from a stick. [De Jonnès Monog. 41.]

Austro-boreal axis of yellow fever.

whose austro-boreal axis from Rio de Janeiro, in South America, to Rochefort, in France, is nearly seventy degrees, not to mention its still greater extension in 1803 to the Siberian peninsula of Kamtchatka, lat 56° 30′ N., about ten degrees further North, thus covering eighty parallels of latitude, including about three-fourths of all the land, and a still greater proportion of the inhabitants of the globe, still the disease has not appeared within these vast expansions, except in a comparatively few places. Towns the most dissimilar in topography and even in temperature, suffer or escape attacks in an inexplicable manner. But of all appreciable conditions, temperature is generally regarded as the most important; nay, it is regarded by many as the true cause.

Heat.

The most remarkable feature in the weather of the summer of 1853, is that of the diminished heats in the whole tier of Southern States bordering on the Gulf of Mexico in which yellow fever prevailed, compared with the Western, Middle and Northeastern portions of the Republic. L. Blodget, Esq., in charge of the Meteorological Department of the Smithsonian Institution, in an able paper "on the climatic conditions of the summer of 1853, most directly affecting its sanatary character," an official report for June, July and August, from ninety meteorological stations from Canada to Florida and Texas,* shows that in the fourth week of June, the maximum heat from New York to Savannah gave an average of 95.° Now the corresponding week in New Orleans gave, according to Lillie's tables for the corresponding week, only 92° as the mean maxima, and throughout the whole epidemic the average never for any week equaled that of the above mentioned central zone where no yellow fever appeared. The average maximum temperature of the week ending August 26th, in New Orleans, was 91,° while the mortality was the greatest, amounting to 1,667, or more than 238 as the average per day, the temperature averaging one degree more than that of the week ending September the 15th, during which the mortality was only 411, averaging less than 59 per day. The average maximum temperature of the week ending October 22d was 82,° two degrees more than that of the preceding week, though the number of deaths did not differ more than three for that period.

Blodget.

Mr. Blodget says: "A most extraordinary heat occurred on the 29th and 30th of June, beginning earliest at the West by a day and a half for the distance from St. Louis to Washington. This extreme was central in the latitude of Washington, and was limited at Savannah on the South, and Burlington, Vermont, on the North, attaining 96° to 98° in Tennessee, Kentucky and Southern Ohio, and 99.5° to 102° at Washington and in Eastern Virginia and North Carolina. This is without any known parallel in the records of temperature here, and is several degrees above any recorded temperatures at New Orleans, Mobile, or Savannah. The mean of June was much above the normal one, attaining a maximum of excess in Wisconsin and Illinois of nine degrees. In August, a period of general excessive heat occurred, beginning, as usual, earlier at the West. The maximum in Illinois and the adjacent States was 90° to 94°, from the 8th to the 13th: in Ohio and Kentucky nearly the same; and passing Eastward, the district of greatest excess was central New York. The temperature was below 80° at Cedar Keys, Talahassee, and Pensacola, Floridia, through these days, and at no place South reached 90°. The mortality from the effect of great heat with great saturation was frightful—some term more compre-

*N. Y. Jour. Med. Nov. 1853.

hensive than *sun-stroke* seems required to designate the fatal congestion, or whatever may be the immediate cause of death, in these cases. * * * Mean temperatures and amount of rain are given in a tabular form from over ninety stations. The normal curve [or mean] at New York and Northward is a rise of 4° to 4.5° from the mean for June to that of July, and a fall of 3° to that of August. At Philadelphia and Southward it is somewhat less, decreasing to the Gulf coast, where the curvature disappears."

It was not until June that the yellow fever showed itself even in the sporadic form to any considerable degree—the week ending on the 30th of the month gave as the average of maxima 92° in New Orleans. Now, Mr. Blodget's tables will show that on and about the day aforesaid that the maxima temperatures were as follows at the places indicated where yellow fever did not show itself: Alexandria, Virginia, 95°; Knoxville, Tennessee, 94.4°; Oberlin, Ohio, 95°, 17th, 97°; Baltimore, 92.3°, 22d, 96.2°; Camden, South Carolina, 97.6°; Sparta, Georgia, 97°; Eutaw, Alabama, 101°, (the day before 104°;) Lebanon, Tennessee, 95.90; New Harmony, Indiana, 28th, 97.5°; Bloomfield, New York, 21st, 99.5; Philadelphia, 95°, 20th, 96°; Sparta, Georgia, 97°; Brooklyn, Michigan, 21st, 97°; Poultney, Iowa, 20th, 97°. On the other hand many Southern towns were compartively cool—those which escaped as well as those which suffered from yellow fever. Jacksonville, Florida, on the last day of June, 84°; Pensacola, 85°. Again, compare the 15th of August—Smithsonian Institution, 91°, (the 14th, 94°;) Alexandria, Virginia, 92.3°; Savannah, Georgia, 77°; Jacksonville, Florida, 87°; Culloden, Georgia, 82.40; Austin, Texas, 82°. This period including the preceding two weeks and the week succeeding was the hottest part of the season in New Orleans, the maximum ranging from 93° to 94°, being much greater than that which attended the invasion of the epidemic. The week ending the 28th of July, gave an average of 87°, although the mortality at that time from yellow fever fell but little short of 1,400 during the month.

If we compare the summer heat (June, July and August) of the yellow fever zone with Northern latitudes, where yellow fever did not appear, it will be found that even the mean temperatures of the entire hot season correspond very nearly in many instances: the mean of New Harmony, Indiana, for June, 79 3°, nearly the same as Pensacola, which is 80°; Baltimore 77.7°; Savannah 79°; Lebanon, Ky., 79.5°; Camden, S. C., 79.3°; Danville, Ky,, 79.3°; Mount Vernon, Ohio, 78 9°, agreeing within an inconsiderable fraction with Cedar Keys, Talahassee, Pensacola and Jacksonville, (78.9°) in Florida, and Eutaw, Ala., Austin, Texas, and other places.

The quantity of rain which fell in New Orleans in July, August and September, amounted to 16.81 inches, nearly two-thirds of which fell in July, which is usually the most rainy month in New Orleans—nearly one-third fell in the next month, leaving but the fraction of an inch for the latter, which, with the month of October, is the driest season of the year. **Rain.**

On comparing July and August, the two great epidemic months in New Orleans in 1853, it will be seen that there was nothing peculiar—nothing that can account for the epidemic in regard to the quantity of rain, which was in some places greater or less than in regions free from the fever, and sometimes similar. In these two months there fell 16.81 inches of rain at New Orleans; at West Point, N. Y., 18.28; at Richmond, Mass., 14.235; at Montreal 10.191; at Philadelphia 9.37; at

Richmond, Va., 8.63; at Anne Harbor, Mich., 5.06; at Bedford, Pa., 3.877; at Savannah, 14.632; at Jacksonville, Fa., 10.1; at Pensacola, 4.078; at Cedar Keys, Fa., 15.1; Eutaw, Ala., 14.739, &c.

It is the more necessary to dwell upon these facts, because writers often most pertinaciously argue that yellow fever is owing to rain, when a rainy season and an epidemic happen together, as in 1839, when, during an epidemic, it rained almost every afternoon for nearly two months. On the other hand, when an unusual drought and a severe epidemic prevailed in 1837, it was argued in like manner, that the absence of rain for a like period (with the exception of a few showers) was the source of the evil.

CHAPTER XI.

SANITARY TABLEAU OF THE BUILDINGS AND TOPOGRAPHICAL IMPROVEMENTS OF NEW ORLEANS.

Buildings. How the style of building in New Orleans has so long escaped the legislator, the grand jury, the landlord and the sanitarian, is marvellous. About ninety in every hundred houses even in the richer portion of the city, are constructed in a manner that must be condemned in any climate, bnt in none so much as in this city, depressed as it is below the high water mark of the river almost every where, and in the rear nearly on the sea level. The lower floor, which rots about four times in ten years, in a great majority of the houses, especially the stores, rests on the humid soil, sometimes at a lower level than the streets, no air being admitted underneath!

Soil. The fresh water, newer pliocene, being largely mixed with decaying animal and vegetable matter, moistened by rains, and infiltrations from the river, gutters and swamps, generates perennial crops of *algæ*, *fungi*, *infusoria*, blight, mildew, Fungi. mould, &c., which abound in, under and around the lower story of these unventilated houses, where, indeed, crops of mushrooms would flourish, were they not repressed by the tread of the tenant. Hence goods rust and spot, delicate colors are discharged; health, too, is deteriorated from moist and insalubrious exhalations during the day, and at night, as many persons sleep upon these decaying humid floors.

Physicians in visiting the poor, especially in depressed portions of the city, must have often found the flooring of houses floating, and sometimes, after rains quite covered with a water too filthy and offensive for description—laboratories for generating carbonic and other deadly gases, predisposing to disease, and rendering recovery from any kind of sickness tedious, too often impossible. What drug can supply the place of pure air, pure water, dry sleeping and business rooms?

The lower floors (on which the principal business of the city is done, and on which is stored the most valuable merchandise) resist decay but a few months, whereas the most perishable kinds of wood, and even cotton and linen fabrics, with their original colors, will, if kept dry, last for thousands of years, as witnessed in the tombs of Egypt, where the cerements of the dead are comparatively sound, while their coffins (made of sycamore, a wood that speedily rots, where moisture is present) are as sound as they were thousands of years ago, although they had been placed in excavations, often little elevated above the inundations of the Nile

It would appear from a cursory glance at many new business houses now going up in New Orleans, that instead of having one or two feet of free air circulating under the lower floors, the latter have been sunk to a level, lower, if possible, than usual.

In some cities deep cellars are dry. The depressed, inclined plane on which New Orleans stands, below the high water line—the river before, the swamps behind, subject to sudden inundations from enormous rains, all combine to prove that floors ought not to be placed directly on the mud, though in other cities this mode of building may be less injurious. In New Orleans it ought to be interdicted by law. It is to be regretted that the two conditions that ought to be most desiderated, are the most neglected—the two conditions most necessary to the preservation of health and merchandise, namely: elevation and dryness—drainage and the free circulation of air in and under houses. Elevation and dryness.

Although the climate of New Orleans and lower Louisiana has been regarded as unusually humid, it might with more justice be viewed as being, for a considerable portion of the year, remarkably dry. Mr. Darby maintains that after the season of inundation, lower Louisiana is, for eight months of the year, drier than any woodland in America.* The desiccating process in New Orleans is naturally rapid, as might be anticipated from its almost constant breezes, elevated temperature, and great number of cloudless days. Were the swamp-zone cleared, ditched and drained, these conditions so favorable to evaporation under a powerful sun, would make the soil as dry as it is rich and productive. Desiccation

Enough is already known of the science of Hygiene to warrant the conclusion that our crowding filth, a want of ventilation, incomplete drainage and humidity must be injurious to the health and detrimental to the physical comforts of the citizens of New Orleans. Healthy individuals and still more the sick ones need pure air, both when there is and when there is not an epidemic. Hygiene.

Effectual under-ground drainage is, as it seems to me, scarcely a physical possibility in New Orleans—if possible, the expense could hardly be paid by the treasury of the United States, and if accomplished, it would prove to be an intolerable nuisance. A gentleman recently from Paris, and, perhaps, the ablest quarantinist in New Orleans, informs me that in Paris where underground drainage, with a soil elevation and declivity so vastly superior to New Orleans for this purpose, is mischievous. The Parisians find that the filth of the city accumulates in these subterranean sewers so as to send forth the most offensive and deleterious emanations. Hence, they prefer, after costly experiments, surface drainage, and wash off the filth into the Seine. One heavy rain in New Orleans would change this abstract theory into a concrete mass of filth, which would fill these subterranean canals, which, lying as they must, below the level of the river, and even below the level of the sea and lake, would send forth emanations strong, but not wholesome. These subterraneous passages would afford a good living and secure habitation to the infusoria, algæ, conferæ; vast reservoirs of animal and vegetable organizations, good for microscopical investigation, but not fit to be smelled. Under ground drainage.

The sewers (*cloacæ*) of ancient Rome passed under the whole city; the *cloaca maxima* of Tarquin, was sixteen feet broad and thirty high, built of hewn stone, three miles long, one mile through a mountain a thousand feet high; the mouth of this sewer is still seen where it empties itself in the Tiber. These sewers, placed under the supervision of the *curatores cloacarum*, had under-ground side walks.

*St. La. 99, 100.

In the National Clycopædia, (of London, 1851,) it will be seen that the sewers of this metropolis are four feet three inches high, by two feet three inches wide, to allow a man to pass through them for the purpose of inspecting and cleansing them; others are twelve to fourteen feet high. "The inclination of sewers should always, if possible, be sufficient to enable the water to run freely, and to carry off the solid matter that usually enters with it. In the metropolitan sewers the inclination varies from a quarter of an inch to an inch and a quarter in ten feet. It is some times very difficult to obtain a sufficient inclination to a sewer. The depth of the Watling street sewer is from thirty-three to thirty-five feet. In many cases, however, there is a space of not more than three feet between the surface of the road way and the crown of the arch of the sewer. Wherever it is practicable new sewers are built at a considerable depth from the surface." This would be particularly necessary in New Orleans, where there is much heavy drayage. Now let us see what is the fall from New Levee street, the highest part of the city, to Claiborne street, not to mention streets still more remote, yet on nearly the same level. Fall to Claiborne about nine feet six inches: suppose a sewer four feet six inches high, reaching within eighteen inches of the pavement or surface; the bottom of this sewer will then be only five feet above the level of Claiborne street, reckoning from New Levee, the highest of all streets—allow a fall of only half an inch for every ten feet, much of which is expended near the levee: the distance to Claiborne being 4,338 feet, the fall would be about eighteen feet; or if we adopt the London standard of one inch or one inch and a quarter (to scour off the filth) the fall would be thirty-six to forty-five feet, and if carried through the Metairie ridge, would average for the whole city a fall of about 90 to 145 feet, and to the lake 180 to 290 feet. Observe that the fall from the levee to Claiborne is all expended but about ten inches in the first half of this distance! and that even this terminus, in Claiborne, has been covered two feet deep by the lake during hurricanes, the water having reached within five or six squares of the levee, so that under-ground sewers would have been inoperative except along a narrow belt next the river. If the sewers were placed at the usual depth, the refluent water of the lake, would have filled them up completely to their roofs! The bottom of a sewer at the ordinary depth in Claiborne, and in half of the streets of New Orleans, would be below the ordinary sea level! They would be little better than inaccessible reservoirs for collecting the filth and alluvium washed off from the inclined plane on which the city stands Every heavy rain would deposit an immense amount of detritus, which, in the absence of a strong scourring current, would fill all the sewers with solid matter which would emit the most offensive odors.

Surface dainage. By adopting the experimental instead of the verbal or paper method of dainage, and using a moderate amount of common sense, much digging, and a good deal of capital, just as the Dutch have done in Holland, by which the land has been wrested from the dominion of the sea, New Orleans and its environs as far as Lake Pontchartrain, might be changed from mosquito-lands and putrefying sheets of water, to horticultural, pasturage and meadow lands. The almost uniform levels of this district near the lake is not without some compensating advantages, inasmuch as expensive gradings and deep cuttings for ditches will not be necessary. The elevations and inclinations of the Metairie ridge, may prove advantageous rather than injurious, in several points of view, in giving direction to the waters; while the natural plane on which New Orleans is built, has a sufficient inclination and prolongation towards the lake to give a strong current to the rain water from the levee, as far as the cypress swamps.

With suitable lateral and lake levees or dikes, efficient draining machines, and ditches passing through and connecting the lowest levels, there can be no doubt, it may be repeated, that the swamp district lying between the already leveed river shore and the lake could be completely drained.

There is no part of this district which prevents difficulties, in surface drainage, comparable to those met with in the under-ground drainage of the site of St. Petersburg, a city which was founded in the midst of deep and wide marshy forests, at a level so low that during storms it has often happened since 1715, as it did in 1824, that hundreds of lives were lost by drowning, ships having been stranded in the streets or dashed to pieces against imperial palaces, the inundations having covered the highest grounds in the city. St. Petersburg

Peter the Great having visited Holland, where he witnessed the system of dikes and drainage in that country, determined to found another Amsterdam, though in a most unfavorable locality. Amsterdam, once the most commercial city of the world, was, as all know, built on piles, on account of the depth of the marsh in which it was founded. The city hall, now the royal palace, constructed in 1648 rests on 13,659 piles, and a church recently built has nearly half of that number. Amsterdam.

Peter having rejected piles, adopted a different and almost impracticable mode of draining the site of a city that should transmit his name to the remotest posterity, namely, under ground drainage. Instead of trusting to an abstract ukase, or act entitled an act, &c., he built him a little hut, in 1703, on the river Neva, between Lake Lagdoga and the Gulf of Finland, where, seven years after was built the first brick house, and where he sacrificed one hundred thousand lives, chiefly owing to his method of under-ground operations, the earth having often caved in, burying the workmen. Canal excavation with proper hygienic regulations, fortunately is not necessarily attended with unusual sickness. Before the epidemic broke out in New Orleans, from fifty to seventy-five men were engaged in excavating the great basin, 300 feet wide and from 8 to 12 deep, near the junction of the Bayou St. John and the canal Carondelet, a mile from the city, and a still greater number were similarly engaged at the junction of the bayou and Lake Pontchartrain, among whom no sickness appeared.

In several countries large lakes have been drained. Harlem, a navigable lake, almost as deep as lake Pontchartrain, fourteen miles long and nearly as wide, was but a few months ago disappearing rapidly, and will soon become a dry, fertile basin or plain, though it is still called in the maps of Reece's Encyclopædia "the sea of Haarlam," and all by means of one or perhaps two steam engines which pump out the water. Harlem Lake.

CHAPTER XII.

CONTAGION—INFECTION—MIGRATION.

There is no probability that any satisfactory conclusion will ever be established as to the contagiousness of yellow fever or the contrary, so long as the words contagion, infection, misasma and the like, are used in a latitudinarian, vague and undefined manner. Contingent contagion, conditional contagion, occult changes, unknown predispositions or ever varying circumstances, as heat, rain, drought, swamps, Explanations.

vegetable and animal decomposition, assumed emanations from the sick, and the like, are so mixed up as to afford ground for endless controversy If one explanation or assumed condition shall fail, another is held in reserve to be called in to aid the wily logician in his extremity. The dry season of 1837 and the wet one of 1839 served at the time to explain two epidemics.

A word is, in an investigation of this kind, best explained by a thing, a type or example, as au unerring criterion, and not by another word equally vague and darkly enveloped with unessential, contingent, wholly unknown or ever changing hypothetical conditions. If the supposed contagion of yellow fever be by contact, as the itch, or by a volatile contagion, as in small pox, let it be tried by these typical or fundamental tests, and not by the assumption of one or many other contingent circumstances which may happen as coincideuts, not causes, nor even invariable accompaniments.

Contagion. Contagion in its most literal and restricted sense implies the actual contact of a well person with a dead, or sick person, or his apparel, etc, by which a specific posion is transmitted from one to the other, reproducing a similar disease, as in small pox, cow pox, itch, etc. In a more enlarged sense, this term includes invisble emanations from the sick consisting of a specific poison, doubtlessly, dissolved or suspended in the air, and capable of reproducing a similar disease in any indefinite number of persons who come near the patient, of which small pox again affords the most complete typical illustratiou. Here the fundamental idea of contact is, perhaps, real, though unseen.

Proximity. Another type or criterion of contagion is this—it cannot act except within a very circumscribed space, in any season, latitude, or climate; it may be limited by isolation from, or non-intercouse with the healthy; its extension probably might reach from pole to pole, if all could be brought in proximity with a single sick individual, although the emanations from his body at a few feet from the same, mixing with the atmospheric ocean, become harmless, not epidemic.

Infection. The word *infection* generally used as synonymous with the word *contagion*, has, too often, played a conspicuous, if not a satisfactory *rôle* in the vague and inconclusive disputations of yellow fever quarantinists. If the word infection mean an emanation of a specific ærial poison from the sick, giving rise to a similar malady in the well, it must be precisely the same as contagion; but if it mean an impure air arising from an animal or vegetable source, or from both combined, then it is but another word for miasma, malaria or bad air. The labored attempts to explain this word—the bad faith in which it has been used—at one time for contagion, at another for the bad air of a sick room, a sick city, a vile scent, or paludian exhalation, go to show that it is a most perfidious word, the shibboleth of dialecticians—a word pregnant with mental reservations. It is the limbo of countless pamphlets, books, and laws upon yellow fever quarantine—the lumber of the last and present centuries.

If *infection* be used to denote the contamination of the atmosphere of a room, or of an urban district or focus, with or without offensive scent—an emanation from vegeto-animal decomposition, not an emanation of a specific nature from a sick man, which, in any climate, season, and latitude, produces a similar malady in the well, then the word becomes intelligible. Such contamination, however, does not originate a strictly contagious disease, though it may, and often does, aggravate the latter. Seclusion from sick persons does not ensure exemption, while the individual lives in the infected district. The locality, not the person, is dangerous.

Migration or flight, unless in the beginning of the epidemic, is of questionable expediency, for many reasons. For although the chance of suffering an attack may be slightly diminished by leaving the city after the epidemic has become general, the chance of a cure in the city is increased. The excitement and fatigues of traveling are likely to develop and aggravate the disease. Migration.

The epidemic of 1853 has clearly proved that when the yellow fever zone is expanding throughout the Southern States, while the epidemic is steadily declining, so as to be nearly extinct, flight to New Orleans is a prudent measure. When the epidemic was marching upon the towns and villages of Louisiana, after its declination in New Orleans, many persons came to the city for protection, and to the discredit of the doctrine of contagion, escaped.

Early migration is an all-important measure. It would be too tedious to give even a summary of the multitudinous and striking examples furnished by the late Dr. Chervin, of the efficacy of migration, both in the peninsula of Europe and elsewhere. Baron Dupuytren, in a report to the Academy of Sciences in Paris in 1825, says: "We regard as incontestible the principle of evacuating immediately the places where yellow fever is declared to be, and every thing for this purpose should be adopted. The utility of such a measure must always justify its vigorous execution." Dr. Thomas, after thirty years' practice in New Orleans, from 1818 to 1848, declares* that he never saw or heard of a well established example of the communication of yellow fever to any person in the country by patients who had contracted the disease in the city during a visit while the epidemic was prevailing. The same exemption proved constant when unacclimated residents of the city who fled, but nevertheless sometimes sickened and died, or recovered in the country, after having lived in the same houses and slept in the same beds with the country people. Chervin. Dupuytren. Thomas. Railroads.

The completion of the railroads now in progress will enable both the urban and rural population of Louisiana, at a small expense, to dodge yellow fever in almost the most literal sense of that term, by leaving the infected localities.

The most salubrious retreats during the summer season for the citizens of New Orleans, might be expected to be found in the pine region bordering upon the lakes and the Gulf of Mexico, notwithstanding the single exception of 1853. The late Dr. Drake gloried in these pine woods, as "the healthy localities"—"dense and lofty forests, presenting to the eye a vast system of intercolumniatiou, which, seen at night, by the running fire that occasionally consumes their shed cones and long leaves, with the dry grass amoug which they have fallen, presents a grand and striking spectacle. Such are the celebrated *Pine Woods*,* to the protecting influence of which the people of New Orleans and Mobile commit themselves for safety in yellow fever seasons, expecting to enjoy an equal immunity from intermittents and remittents."

Now, although these piny platforms are not beyond the reach of epidemic yellow fever occasionally, they are far more salubrious abodes in the heats of summer than the far off sultry cities of the north, which are every year overcrowded by southern absentees. The coniferous pines which lie at the doors of New Orleans, and which the good doctor, a lover of Nature, admired, are totally ignored by the lovers of fashionable saloons. What a pity that his account "of the people of New Orleans and Mobile" is not a true one!

* Traité Pratique de la Fiévre Jaune observée à la Nouvelle Orléans, Paris, 1848.

* A Mississippian says that in these Pine Woods, "It is too healthy to support a physician, too honest to need a lawyer, and too free from debt to furnish any salary to the clerk of a circuit court."

CHAPTER XIII.

THE HISTORY AND MYSTERIES OF QUARANTINE—CLASSICAL MODE OF ATTACKING EPIDEMICS.

Quarantine in Europe, established during and after the prevalence of the black plague, was enjoined under the penalty of death and confiscation; but it was found, Law. after long trial, unavailing, as the pestilence returned repeatedly. The law required the patient to be taken out of the cities into the open fields, there to die or recover. No one under pain of death could visit the sick, unless specially appointed for the purpose. An individual coming from an infected district was put to death. Many articles of household furniture were burned, others were exposed to sun and rain for a specified time.

Forty. If quarantine be not a fraud on the many, for the benefit of the few, it is at least a superstition devoid of any philosophical evidence in some of its most fundamental details—as for instance, in its mystical adherance to the number FORTY, adopted in the dark ages (1485) by Councils or Boards of Health, being a monstrous compound of medical, legal, and theological fancies, founded on the duration of the forty days flood; Moses' sojourn of forty days on Mount Sinai; Christ's fast of forty days in the wilderness of Judea, and the Lent fast of forty days in the church ceremonial. Hence the Italian *quaranta* from the Latin *quarantina*—forty days more or less—during which time persons, animals, goods, letters, and ships are interdicted, Detention. confined, restrained by *cordons sanitaires*, or lazar-housed to the scandal of a fast age, which chides the tardy movements of the locomotive and steamship, and is barely satisfied with the velocity of lightning, which brands with the word *fogy* every thing devoid of rapid progression.

Old Britain is more progressive than Young America in quarantine. The voluminous report against quarantine, especially in reference to yellow fever, by the government committee of Great Britain, submitted in 1852, foreshadows the opinion of the forth-coming report against quarantine even for the plague. That report will show what measures "will supercede the necessity of those greivous interruptions to commerce and international intercommunication which quarantine, so universally imposed on account of plague, has hitherto occasioned."

Since it appears that quarantine is soon to reign nominally, if not practically, in Louisiana, its rules and mysteries deserve to be studied and scrutinized, unless yellow fever can be banished by the mere vote of the majority in the two houses of Legislature. The Mississippi river can not be kept down by the act against inundations, nor raised by an act for the benefit of stranded steamboats. Pass from the abstract to the concrete—from the word to the thing—from theory to practice: What is to be done? Action! Action, only! Disinfect air, earth, skies, ships, goods, and humanity. On with the lustration.

"The most important and valuable method of disinfection is ventilation, and, whatever other may be added to it, this should never be neglected. The reputation of chlorine, acids, lime, charcoal, etc., as disinfectants depends on their property of decomposing the offensive gases which are so often mixed in the atmosphere with Methods. the matter of infection, *but it is questionable whether they have any influence on the infectious particles themselves.* However, as the emanations from putrid substances render the body peculiarly liable to the reception of infection, some of these means should be employed where any offensive smell is present. The best of these is chlorine, which may be applied in the form of the chloride of lime, which should be poured over any thing from which odor is emitted; it should be sprinkled about the floor and on the walls; or shallow vessels containing it should be exposed to evaporate in the air; or pure chlorine should be disengaged in the form of gas from the materials from which it is manufactured. Dr. Henry has rendered it probable, by numerous experiments, that the infectious qualities of substances which cannot be conveniently washed, as trunks, packages of valuable merchandize, etc., may be sufficiently destroyed by exposing them to a dry heat of 200° for less than an hour." * Heat.

As it was during the strict quarantine rule, at the close of the last and in the first decennial period of the present century, that yellow fever attained its cyclic culmination, it may be proper to give a summary of the quarantine laws of that disastrous era; and the more so as the same enactments seem to be desiderated at present. The following extracts from Assalini's celebrated work on plague and yellow fever, translated by Adam Neale, New York, 1806, have been kindly furnished by my friend Dr. Cartwright. "Quarantine Code of Marseilles, Toulon, Venice, Cadiz, &c. There are a lazaretto, lodgings, hospitals, and magazines at the quarantine ground. When a vessel arrives, the captain presents to the Board of Health his certificate where the vessel is from, the number of the crew and passengers, and the kind of cargo. This certificate is taken through a grating by a pair of long pincers, and is not read until it has been thoroughly perfumed and dipped in vinegar. If the certificate gives notice of the plague, the vessel is considered *brute* or foul. The passengers and ship's crew are strictly reviewed at a distance, and placed under quarantine. The merchandize is deposited in the enclosure in the magazine. The magazine at Marseilles, for this purpose, is very beautiful. The passengers are put into the enclosure, with one or more guards of the committee *(comité sanitaire)*, while the ship's crew remain on board. The porters and purifiers of the merchandize open the bales of cotton or wool in the middle, and thrust in their bare arms. They break open the chests and trunks, and expose to the air the bales, &c., &c. After having exposed every thing, night and day, for thirty-nine days *(sérène)*, and after having perfumed the passengers and ship's crew three times they are permitted to enter the harbor. If, during the quarantine, any one falls sick and dies, the quarantine is prolonged or recommenced. If sickness and deaths continue, the laws of health condemn the vessel to the flames. Those who compose the crew, after being stripped of all their clothes, and *having their whole bodies shaved* and washed in sea water, are admitted into the lazaretto. The vessel, with its merchandize, is towed to sea, where it is either sunk or committed to the flames. If any of the porters or purifiers get sick and die, the laws of health pronounce the goods infected, and they are burnt. Assalini. Code. Ceremonial.

"1st, Contaminating; and 2d, non-contaminating cargoes.

"1st. Cotton, wool, silk, furs, &c., contaminating.

"2d. Paper, stuffs and samplers, gold and silver ware, glass, not contaminating. Such things are cleaned by perfuming or putting in water or vinegar.

"Herbs, fruits, and flesh of animals are non-contaminating, and can be purified by putting in water."

* National Cyclopædia, vii. 470—1. Lond. 1851.

"Experience has proved that these seclusions, or shuttings up, have never succeeded in arresting the progress of the plague. This disease always commences by attacking the poor in the most unwholesome quarters of the city; after which the health of the inhabitants in good circumstances become impared, and at length death levels indiscriminately the poor and the rich. The season changes and all at once the epidemic ceases.

"The Franks, residing in Egypt, to guard against the plague, shut all their doors and block up with care the smallest holes until St. John's day eve. The cats of the family are shut up in cages, like fowls, and if, unfortunately for them, they chance to leave their prisons and make their escape, on their return they are killed without mercy, according to the sanitary laws. Near to the gate of the house are placed three large earthen vases filled with water, a bason with vinegar, a furnace with coal, some odoriferous herbs, antipestilential powders and pastes, iron pincers, a large knife, and other utensils. Each family has a domestic who is not comprised in the shutting up, and who is employed to transact all commissions. He comes every morning with the necessary provisions he has bought at market. The porter, who is the steadiest member of the family, and the most strict observer of the sanitary laws, after being reconnoitered, the domestic descends with the key, opens the door and retires. The domestic enters the court, puts the provisions, such as meat, fruit, fish, herbs, etc., into the vases full of water; the money he puts into the vinegar. Papers, bills of exchange, etc., he puts near the furnace and retires. The porter then shuts the gate. Then having taken in his hand a magic ring, he stirs the meat, fish, herbs, etc., in the water. He then takes the money out of the basin of vinegar, and having lighted the coals, he throws on them some perfumes. He then takes the papers with the pincers and places them over the furnace two hours in the smoke. Sealed letters are purified by piercing them with a stiletto in two or three places and dipping them in the vinegar."

During the black plague in Europe, the merchants carried their money into the churches, depositing it at the foot of the altars, and, returning home, calmly departed this life. The priests dared not touch the golden heaps for fear of *contagion!* (Ozanam. Hist. Méd. iv. 87.) How can a sincere contagionist dare to touch New Orleans bauk notes?

The late Cyclopædia of London says that "letters coming from and passing through the plague countries *are opened* and fumigated at the lazaretoes." The affairs of war, love, politics and speculation might be damaged by the *opening of letters,* independently of the detention. In Oriental realms where a belief in fatalism is prevalent, a quarantined man submits to a resistless destiny, in preference to the knout, the bastinado, the bowstring, an impalement or a fusilade.

Boisseau. M. Boisseau, of Paris, in his work on fevers, says that "before and since quarantine was established in France, yellow fever has not appeared, although the communication has been frequent between the ports of Spain and France. This disease fortunately having never reigned epidemically in our country, it cannot be decided whether we have been preserved by quarantine or by circumstances independent of all human intervention."

France. French quarantine, (as good as any,) is, in many of its features, founded on assumption wholly unwarranted by positive knowledge or probable truth. The *patente* or certificate of health given by consuls to vessels leaving port has several distinctions, as the *patente nette* showing that the vessel leaves a country unsuspected of infection; the *patente brute*, for which quarantine is required on one coast from ten to thirty, on another fifteen to forty days. The *patente suspecte*, from a country not altogether free from suspicion, requiring from five to twenty days quarantine on one coast, and from ten to thirty on an another; the *patente brute* varies from ten to thirty in one place to fifteen or forty days in another, as if there was the smallest proof that these numbers are better than half or ten times the numbers specified.

The theory that something must be done to arrest epidemics has been, is now, and ever will be popular. When, twenty-five centuries since, epidemics began to ravage Rome, the worship of Æsculapius was introduced into that city, with the view of preventing pestilence.

Brutus, the Roman Consul, more that twenty-three and a half centuries since, sent an ambassador to Delphos, to consult the oracle how the plague, then epidemic at Rome, might be stayed. Had he organized a Howard Association, like that of New Orleans, with a treasury of 1,200,000 *denarii* for distribution for nurses, medicines, food, and medical attendance, himself taking an active part in the work of charity, he might have done the city some service, without calling in the aid of imaginary oracles.

Classical and Howard methods.

Epidemics ravaged Rome in the years 451, 432, and 396, B.C., whereupon pestilence was again attacked vigorously by the ceremonial called *Lectisternium*, or funeral banquet of the gods, instead of adopting the obvious remedies, like those of the New Orleans Board of Health, in 1853, that is the establishment of temporary infirmaries, the appointment of physicians, nurses, and funds for the poor. A terrible pestilence began in Rome, 293 B. C., which, having lasted three years, was attacked by a sort of sanitary commission, consisting of ten ambassadors, who, instead of looking at home for causes or explanations, or sick people in distress, went on a journey to Epidauris, in Greece, the natal city of Æsculapius, near which the god of health had a most magnificent temple.

Lectisternium and the Board of Health.

This sanitary commission having gone up a valley five miles from the city, reached the famous temple always crowded with invalids and priests or doctors, implored the aid of the Epidaurian god. They brought back to Rome the god himself, under the figure of a serpent—a highly valued prize, which, how much so ever it may have delighted the Romans for a time, failed at last, as the plague returned twenty years afterwards with augmented virulence. This sacred snake, placed in a temple built on an island of the Tiber, disappeared among the reeds on the shores of that river.

It is highly probable, however, that the worship of Æsculapius was beneficial in Rome, and would prove so in New Orleans, inasmuch as it requires as preparatory measures, sobriety, fasting, bathing, tranquility, and the like, in order to fit the mind and body for divine intercourse, visions, dreams, and therapeutic revelations. Neither Æsculapius nor his lovely daughter, Hygeia, Goddess of Health, is worshipped in the usual abodes of yellow fever, typhus and cholera, where whiskey, bad air, humidity, crowding, irreguiar hours and the neglect of cleanliness are substituted for the Æsculapian rites, and no act of the Legislature can change this condition of things, how potent so ever may be its language.

CHAPTER XIV.

QUARANTINE AND CONTAGION CONTINUED, WITH ILLUSTRATIONS.

Contagion. At the beginning of the prosent century and for some years after, the yellow fever element was so mingled with the great concerns of humanity, that it excited the public mind to an unexampled degree; in the cabinet and in the field, in the legislative halls and in medical schools, both at home and abroad, in the colonial governments. It had long been the conqueror of armies and navies, and now threatened to desolate the peninsula of Europe. Its contagiousness was a leading topic on which reports, pamphlets and books went forth, raging like the epidemic itself. Neutrality was scarcely possible in a matter so deeply involving the interests, passions and transactions of humanity. Opinions founded on mere hypothesis concerning the cause of this malady which remains to this day unknown were not for that reason less, but even more positive and dogmatic. Affidavits and affronts, certificates and satires, logic and duels,* personal contagion and personal invective, bad air and worse legislation, divided the professional and non-professional public on this question. The non-contagionists, however, greatly outnumbered their opponents. They, for the most part, controlled the legislation of the States of the Union, by their efforts or their arguments. But no sooner were they off their guard than the contagionists appealed to the fears of the public, and urged the legislature *to do something* for the protection of *the people*, by making laws against the importation of yellow fever, whereupon new laws were often enacted with no effect in this behalf. The anti-contagionists, like Sisyphus, must roll the stone perpetually—then, now, evermore. Now is the favorable moment in New Orleans, just after the great epidemic. Something must be done. Formerly, nearly all the worst epidemics in Louisiana, and particularly in the peninsula Europe, took place under the strictest quarantine *régime*. If quarantine goes into effect now, a new era will probably have commenced. For, upon the doctrine of chance or probability, no such severe an epidemic may occur for a generation, and quarantine, if such a thing were really practicable, will not be slow to claim the credit; but if 1854 should be no better than its predecessor, then yellow fever quarantine will be for the hundredth time repealed, and yellow fever will be attacked in a more scientific way—first by doing no harm, and next by sanitary measures within the narrow range of the human understanding. An eastern monarch taught his subjects that the sun rose only at his command, but he always gave the command at the *proper time*, that is, *sun rise*.

Contingent logic.

Oriental logic

Village logic. Contagionists have during this, as well as during all former epidemics, collected facts to prove their theory. A pedlar, from an infected district, arrives in a town—his pack is opened—he, the family, and many of the villagers die of yellow fever. Exactly the same occurrences (which are mere coincidences,) take place a hundred times, where there has been no pedlar—no box of goods opened—no travellers from the infected districts. In one town, a crate of crocks from New Orleans is said to have been the medium of transmitting contagion to the village; but at that very time nearly all the other towns for 500 miles around were falling under the malign

*In some cases both parties, the contagionist and the non-contagionist were killed.

influence of the epidemic. It would be most extraordinary if crates, boxes, passengers and pestilence should never happen to get together—not as causes and effects—but as coincidences, necessary in the ordinary course of business. If the pestilence got into town before the arrival of a bale of goods, the former did not cause the arrival of the latter. If the man who opens the goods dies of black vomit, together with all his family, a hundred other families take the disease without any such apparent exposure, and die in like manner A planter fences up his grounds, and secludes himself, family, and slaves, and all escape; another does the same thing, and all are attacked. **Co-incident.**

The great majority of the learned in Europe attributed the black plague to the conjunction of Saturn, Jupiter, and Mars on the 24th of March, 1345; just as many now attribute the late epidemic to events that happen to coincide in time and place. **Astral logic.**

Those not irrevocably wedded to contagion, might find it useful to study the events which have passed before their eyes within the last seven years. **Home logic.**

The late Mexican war furnishes the most complete refutation of the contagiousness of yellow fever in the absence of quarantine, so far as negative evidence can go. If the United States Government had tried to devise an experiment, on a vast scale, to ascertain whether yellow fever could be propagated by ships and armies, it could not have achieved its purpose more effectually. In 1846–7–8, this malady existed in Tampico and Vera Cruz, and was very severe in New Orleans in 1847. The troops and the material of the army, leaving New Orleans for Vera Cruz, and Vera Cruz for the interior of Mexico, did not suffer themselves from yellow fever, nor spread coutagion through the towns and country. In 1848, thousands of the returning soldiers passed through Vera Cruz in June, where yellow fever existed, and on reaching New Orleans in July and August, a few died out of fifteen thousand who remained in the city and its environs some time, without communicating any disease to the city by means of their goods, army materials, and selves. Thousands thus, without having been quarantined, remained in the city for a time, and quitted it for their homes, in other towns and places, without having communicated the disease to any one. After the reduction of Vera Cruz, yellow fever appeared, and many invalids and sick persons were sent to New Orleans and other places for treatment, in the transports which carried out the troops, yet they did not propagate the disease any where. Thus at least fifty thousand experiments made in Tampico, Vera Cruz, and New Orleans, not to name other places, produced no proofs of personal or other kind of contagion, though in both the first named places yellow fever prevailed moderetely among residents not acclimated.

The Board of Health of New Orleans, in an official announcement, shows, that for the month beginning with the 26th of November, 1853, that 6,707 passengers from foreign parts, chiefly emigrants, had arrived at our wharves in forty-seven sea-going vessels, by the river route. Now, if we add the number which had previously arrived, to the number which has since arrived from sea, the aggregate will scarcely fall below 10,000, while by other routes, chiefly by the river, the emigrants, asbentees and other unacclimated persons, as the steamboat population, coming to the city, in September, October, November and December, forty thousand more may be added, making fifty thousand—fifty thousand living experiments against possible contagion —fifty thousand exposures to all of the possible sources of contagion—the houses, goods, etc., of persons recently dead, including emanations from the sick and dying, during the decline of the epidemic and during the whole of this period—all proving harmless!

Rio de Janeiro

If the yellow fever be contagious or transportable, why has it not been carried beyond the tropic of Capricorn during centuries of active intercommunication? Why did it appear only *North* of the Equator, with two or three exceptions, always near the line, until 1850, when it traveled for the first time to Rio de Janeiro, which however is within the tropic?

Such vast, yet significant experiments quite overthrow those few cases where the opening of a box or bale of goods is followed by yellow fever—mere co-incidents not causes. There is not the least reason to think that the world, combined for the purpose, could create an epidemic yellow fever, or even a single case in any city street, or house, upon the globe.

The enlightened governments of Europe, whose inter-tropical possessions enable them to judge from large experimental intercouse, have not only gradually lost confidence in quarantine as a preventive of yellow fever, but they oppose it as altogether mischievous—at least such is the case in Great Britain. Quarantine in our own country is nominal, illusory, and never comes up to the theory of real quarantinists. The deception is, therefore, less mischievous than an honest enforcement would be.

The provisional assumptions of contagion, seclusion and quarantine in yellow fever, once altogether proper and wise anterior to experimental tests, are now no longer such. In the hour of despair and ignorance, the theory that the building of a large city in a country where earthquakes and volcanoes prevailed, would prevent them, might be tolerated until after a fair trial. But, if experience prove that earthquakes continue as before, the building of cities for this purpose should not continue.

Ultima ratio regum.

If faith is best proved by works, the contagiousness of yellow fever in New Orleans falls to the ground; because, in practice, it is disregarded both by the acclimated and the unacclimated, inasmuch as doctors, nurses and neighbors visit the sick in the freest and most fearless way, and with equal impunity with those who keep at a distance from the sick. Experience shows, both in hospital and private practice that proximity to the sick does not enhance the danger to one living in "the infected district."

In the rural districts and in the towns where fear was great, and experimental knowledge of the fever little, the people adopted a different line of conduct—the principle of seclusion and non-intercourse. The traveler, denied the hospitalities of the house because he had merely passed through an "infected district" or village, wandered along the road seeking shelter in vain for the night. Towns suffered for want of provisions, because their rural neighbors feared to approach the sick. Sometimes *depôts* were established near these self-beleaguered towns, where the sick or their attendants and families went for supplies and thereby escaped starvation. The artillery placed at the landings and wharves, threatened to send grape and cannister shot into boats and vessels that dared to approach from infected districts. Individuals, as well as towns, carried out the principle of seclusion, and were alike unsuccessful.

Although the quarantine party is to a great extent composed of men of the highest integrity, talent, patriotism and disinterestedness, yet it is feared that some who profess quarantine loudest are, at heart, infidels; if they are sincere they are not consistent. By what code of morality can they justify themselves in dispensing with quarantine in any case like the following example taken from the Daily Delta, of September 13th, 1853? Capt. Baxter's statement as given by the Editor:

"Captain Baxter left here [New Orleans,] with the Cherokee on the 12th August last, when the epidemic was at its height, with one hundred and sixty-nine passengers, the majority of whom were unacclimated, and liable to the yellow fever. During the voyage, there were ten of the crew down with the fever, and on the arrival of the Cherokee in New York, there being two still sick, they were ordered into the hospital, where one of them died; the other recovered."

Were the crew, and passengers, (without mentioning the ship and cargo) kept 40 days in the Lazaretto, undergoing fumigation? Not at all. Captain Baxter adds:

"They were all permitted to land in New York after eighteen hours, and the sick members of the crew were alone compelled to go into hospital detention."

Such a quarantine is but a kaleidoscopic illusion. If the New York authorities entertained the belief that yellow fever *is contagious*, they would not, in this strongest possible case of importation, have wilfully exposed the lives of half a million of people, unless they are worse than pirates themselves. Their acts more than their words, show that they have no belief in quarantine as a preventive of yellow fever. The same infidelity is obvious in the actions of the few contagionists in New Orleans. They no more avoid yellow fever patients than they do rheumatic patients, or charity. They are better than their doctrine.

As yellow fever appeared in New Orleans at an unusually early period of the season, and long before its invasion of other towns in the Southern slope of the Mississippi valley, the town authorities, in many cases, imposed quarantine laws for their protection, early in August, as Natchez, Baton Rouge, etc. No exemption—great mortality—neglect of the sick—and other evils followed,—some of which grew directly out of quarantine itself, and were by no means creditable to humanity. While experience shows that quarantines do not prevent yellow fever, they do prevent free intercourse with the sick, nursing, attendance, and the physical comforts, by which the disease can alone be combatted with the greatest success. Fortunately, however, humanity is usually stronger than quarantine in practice; non-intercourse, seclusion and abandonment, which quarantine directs, or necessarily implies, are too revolting to the moral sense to be practiced towards friends, neighbors and relatives, and consequently, in yellow fever, these not being carried out in practice, quarantine will always be violated, until morality and charity shall be extinguished.

If quarantinists are sincere they ought not to export any cotton (one of the articles in which contagion is most easily transmitted) because the contagion is in the city every year. A learned physician of New Orleans, Dr. Simonds, has published a table showing the annual per cent. of mortality in the Charity Hospital, from yellow fever, in every year for thirty years, ending with 1849—so that the stream of yellow fever, with whatsoever of contagion it may possess, is uninterrupted, no year having been wholly exempt in this institution, not to name the city at large. (Dr. Fenner's Reports, i. 123.)

If New Orleans contagionists succeed in getting the city and State governments to establish the contagiousness of yellow fever by a special act, let the same act forbid the exportation of cotton, even to our enemies, in time of war. In time of peace, it would be still more unjust to send infected cotton to the subjects of her

Britannic Majesty, or to the subjects of the Emperor of the French. It would be still more criminal to export cotton and contagion to Philadelphia, New York, Boston and other cities, as a return for their opulent donations to yellow fever sufferers during the late epidemic.

It may be said that a contagionist, how sincere so ever he may be, is not bound to care for his neighbor's interests and health; but honesty requires him to care for both. It is doubtful whether the English Minister was strictly moral when he declared that he "cared for England and English interests *alone.*" The same dubeity hangs over Commodore Bainbridge's toast—"My country if right, but my country right or *wrong.*"

If yellow fever be contagious and transportable, quarantine ought to be enforced by grape and canister, gibbets, prisons and fines, though commerce should perish altogether. The late Dr. Townsend, who was a consistent, honest and able quarantinist, says, in his book on the yellow fever of New York, as it appeared in 1822, that all intercourse with the West Indies [and why not with New Orleans?] should be prohibited for five months in every year, beginning with June, in order to prevent the importation of yellow fever. [229.] He says, that "unless an unbroken line of lazarettoes be established along the whole coast, to guard against the pestilence, we can never hope to be entirely secure. What will avail the most efficient system of quarantine laws, established here and there in a few cities on the coast, if all the intermediate towns, with which a constant intercourse is going on, freely admit vessels, etc." [231.]

If quarantine is to reign in New Orleans, let it be as rigid as in the Levant. For no Eastern mummery can be more absurd than that practiced at the quarantine stations of the United States at the present time. The strictness of the East has both consistency and reasou in its favor, (admitting the doctrine of contagion,) which cannot be urged in favor of the West. A doctor of some Atlantic city of the Union goes on board of a ship from New Orleans—the plague stricken city—he *looks* at the cotton bales, and the passengers, and he straight way ignores his own theory, his oath and the law; for in a few minutes or hours after, the vessel is admitted; no one being able to know how he could possibly have ascertained by a look, whether contagion was or was not in the vessel. If yellow fever quarantine be well founded, such conduct is murder by the thousand.

If the laws of the land and of nature have established the fact of the importability of yellow fever by means of persons and merchandise, and if quarantine be necessary to prevent this importation, then quarantine never can be dispensed with by a look or a whim; that is, the laws of nature cannot be changed in this way.

The future. While Æsculapians have no special gift of foretelling which will, and which will not be an epidemic year, history furnishes presumptions, analogies, and deductions, more or less favorable to the future in New Orleans, even though the next few years should be as insalubrious as the past. Epidemics have not only a limited period of increment and decrement in any one year, but they usually have more prolonged periods of increment and decrement, through series of years, often constituting what may be called a cycle of variable duration, after which they generally cease. So it was with the plague in Europe; so it was with the yellow fever in the Spanish peninsula; so it was with the cities of the United States in the north, as Boston, New York, Philadelphia, Baltimore, and other places. Its invasion of the Southern tropic at Rio, so recent and severe, together with its gradual decline in the North temperate zone, may be the precursors of its further Northern declination, and Southern advance, so that both Charleston, Mobile, New Orleans, and other Southern towns and districts have now, at least, the same probabilities in favor of approaching exemption that many other cities further North had, more than half a century ago, before yellow fever appeared on the banks of the Mississippi. New Orleans is now, and has long been, near the Northern border of the yellow fever zone. If yellow fever has, as may be the case, reached its culminating point in this city, its history elsewhere in the temperate zone indicates a progressive decline.

Charleston, desolated at the close of the seventeenth century, was nearly exempt from yellow fever in the first quarter, and in the two last quarters of the eighteenth century. New York was exempt for forty years, ending in the last decennial period of the same century—a period longer than the exemption of which the present forms a part—the prolongation of which may be suddenly arrested for anything that human foresight or science can show to the contrary. The history of the past affords no guarantees that its scenes shall never be repeated. It is as idle to deny as to predict this lamentable contingency. It is consolitary to reflect that the plague as well as yellow fever has almost entirely left Europe, and that the latter disease is scarcely known in the Atlantic States of the republic. No thanks to quarantine! If any visible causes can be assigned for this exemption, the most probable are the extensions of knowledge in hygiene, physiology and physical or sanitary improvements. Thanks to science!

CHAPTER XV.

THE ENS EPIDEMICUM—THE KNOWING THAT ONE DOES NOT KNOW—THE OVERTHROW OF EPIDEMICS.

The public desires and receives with alacrity facts and arguments explanatory of the causes of yellow fever, and, hence almost every writer on this malady, whether born to solve this problem or not, thinks it his bounden duty to satisfy the public, and to glorify science, by conceiving clearly and revealing fully what no one thoroughly acquainted with, both the amount of our positive knowledge and deplorable ignorance of these essential antecedents or causes, can pronounce upon with certainty. A humiliating but true confession this is. Heat, rain, moisture, swamps, vegeto-animal decomposition, contagion and numerous other alleged causes are unsatisfactory and inadequate, as might be shown by travelling over hundreds of inconclusive and contradictory volumes, filled with special pleadings, diluted logic, theoretical biases, and irrelevant facts. The mere authority of great names in science satisfies many—names which serve to guide the multitude, as the bell wether guides his willing, faithful sheep, all of which will jump just as high as he jumps even after he has knocked the fence flat on the ground.

Felix qui potuit rerum cognoscere causus.

It is most certainly the duty of every writer on yellow fever to explain the cause of it if he can, but it is equally his duty not to sin against the decalogue of logic, any more than against the decalogue of Moses. Fortunately the *conditions*, if not the *causes* of yellow fever are to a considerable extent known: for example, it is known to be connected, no matter how, with the warm season of the year, with unacclimated constitutions, with aggregations of people in towns and villages, etc. It rarely attacks rural populations unless they crowd together so as to become virtually towns.

A correct appreciation of these conditions is next in importance to the discovery of the cause of yellow fever—probably the former may prove after all to be more important; for the discovery of the cause, by no means warrants the conclusion that it is necessarily a removeable or a remediable one. The seeds of plants taken from Egyptian mummies contain the vital principle after the lapse of thousands of years and will grow when the proper conditions shall be present, as heat, moisture and earth, while the vital cause is in the plant. It is therefore a fundamental error to require a writer to explain the *ens epidemicum,* or to receive the alleged doctrine of contagion as the only alternative, when he cannot show what the cause *is.* Do not, say the sciolists, overthrow, unless you can build up.

It is better to acknowledge ignorance than to advocate an error. It is better to keep a question of this sort open than dogmatically to close it against investigation. In the former case the truth may be discovered; in the latter, never. To know ignorance is preferable to ignorance of ignorance. To know, that as yet, we do not know is the first step to be taken. Despair is not philosophical. The possible, who can limit it? If the cause of yellow fever has not been discovered, it may yet be. If discovered, whether within or without the body, it may, or it may not be controllable. If it should never be discovered any more than the cause that produces on the same soil a poisonous and nutritive plant, it is probable, that at least, its essential conditions and laws may be ascertained so as to afford advantages and protection equal to those derivable from the discovery of its true cause or combined causes. All the lessons of philosophy teach that yellow fever *has* a cause or combination of causes, without which it cannot appear—with which, it cannot fail to appear, being not the less certain, because unknown in the present state of science. Its antecedents and sequences must prove, when known, as invariably connected and simple as any part of physics.

Ens epidemicum, smoked and cannonaded. Fires.

The practical method of attacking the *ens epidemicum* or epidemic entity is no more satisfactory than the theoretical,—as the enfilading the streets with artillery, the combustion of tar, or the smoking of the enemy out of a place. Dr. Rush and others enumerate such examples. The plague left London, they affirm, as soon as coal was introduced into the city as fuel. Now the part of New Orleans most affected by yellow in 1853, was the very part most afflicted by coal smoke, namely, near the St. Mary's Market, where the foundries of the city are concentrated, as Leed's. McFee's, McCan's, Armstrong's, etc. The burning of gunpowder, and artillery firing in the streets and public squares have sometimes been followed by the retreat of the *ens epidemicum*—just as the eating of a salt herring was followed by the recovery of a Frenchman and the death of an Englishman, from fever. The patriotic Board of Health, of which the philanthropic Mayor was chairman, had done all that was possible to stay the march and to mitigate the evils of the epidemic—scraped the streets—lustrated the gutters—provided for the sick—buried the dead, and wisely quarantined the influx of the *uninfected* immigrants,—they had done more;—for they gave their personal attendance to the sick and dying; in the midst of the crisis, the public mind swaying to and fro like the storm-stricken forest, they yielded to the prevailing opinion. At sun-set the epidemic was regularly, for a time, attacked with great guns. But gunpowder failed. It did worse. Sleep to the sick is the turning point for life—the first glimmer along the dark horizon of the yet dubious morning—sleep was broken—the intellect vibrating between reason and delirium, shattered by the clangor of arms and fever, raved with redoubled violence, and was sometimes quenched at once by a horrid convulsion amid the roar of cannon.

Among the numerous plans advocated by many, was that of tar-burning. This, too, was tried. But the epidemic raged the more. Terror was supreme.

Large fires were kindled in London to destroy the Plague in 1665: "Dr. Hodges says, Heaven wept for the mistake of kindling them and mercifully put them out with showers of rain." In the town of Wheeling, enormous coal fires were kindled in the cholera of 1833. They had no other effect than that of causing one to think (during the nightly round of visits to the sick) how uncertain human life is. Their unsteady flickering lights are significant of the deadly march of cholera. **Fires.**

"The air extricated from fermenting wines, during a plentiful vintage, Van Swieten tells us, once checked the ravages of the plague in Germany." **Carbonic acid**

"Ambrose Parey says the plague was checked in a city in Italy, by killing all the cats and dogs in the place and leaving them to putrefy in the streets." **Putrefaction.**

A fourth part of the population of Europe was falling before the Black Plague. The Jews had been charged with causing the epidemic with a view of destroying all Christians from the face of the earth. They were massacred without mercy, though sometimes tried by commissioners: a writer of that time says, "certain commissioners have been appointed to judge the Jews; I believe none will escape." **Isrealites.**

In France the Medical Faculty of Paris assembled in order to find out the causes and devise sanitary measures to arrest the progress of the epidemic. The doctors, after due deliberation, in a most solemn official manifesto, or medical bull, decided in the most positive manner that the epidemic was "owing to the constellations which combatted the rays of the sun, and the warmth of the heavenly fire which struggled violently with the waters of the sea, originating a vapor in the great Eastern sea of India, corrupted with fish, enveloping itself in fog. Should the same thing continue *not a man will* be left alive, except the grace of Christ preserves him. We are of opinion that the constellations, with the aid of nature, strive, by virtue of their divine right, to protect and heal the human race, and to this end, in union with the rays of the sun, acting through the power of fire, endeavor to break through the mist." The faculty at the same time predicted in the most oracular manner the future movements of the aforesaid constellations: "Accordingly, within the next *ten* days, until the 17th of the ensuing month of July, this mist will be converted into a stinking deleterious rain, whereby the air will be much purified. Now as soon as this rain announces itself by thunder or hail, every one of you should protect yourself from the air; and as well before as after the rain, *kindle a large fire* of vine wood, green laurel, wormwood, chamomile, etc. Until the earth is again completely dry, and *three* days afterwards, no one ought to go about; only *small* river fish should be used; rain water must be avoided in cooking; bathing is most hurtful, and the least departure from *chastity* fatal." **Parisian Faculty.**

CHAPTER XVI.

MORALIZATIONS UPON THE EPIDEMIC OF 1853.

It is doubtlessly wisest not to wed a mournful philosophy. The illusions, as the realities of life are mingled with good as well as evil. Horace, La Fontaine, and Byron have spoken despondingly of the mission and the hopes of humanity:

> "*Vitæ summa brevis spem nos vetat incohare longam.*
> *Quittez le long espoir et les vastes pensées.*"
> "Know that whatever thou hast been 't were better not to be.
> There's not a joy this world can give like that it takes away."

C/

Such inconsolable knowledge not being derived from the dreams of the novelist, nor from the fictitious woes personated by the tragedian, is not only unrelieved, but augmented by imagination, by the anticipations of impending danger during the rapid march of a desolating epidemic, which prostrates hundreds of friends and neighbors in a day, and, like the flash from the tempest-bearing cloud in a starless night, discloses to survivors the perilous rocks upon which the bark of life may be broken in a moment by the fast gathering storm of death.

The bloodiest battle-fields of modern times scarcely can compare with the New Orleans epidemic of 1853, which destroyed five times more than the British Army lost on the field of Waterloo. There were among the people those fluctuations of hope and fear which armies feel amid the shocks of battle, founded on chance and destiny:

> "There's a Divinity that shapes our ends,
> Rough hew them how we may."

"The ball on which my name is not written, cannot hit me, says the soldier in the field of battle—and how, without such belief, could he maintain such courage and gayity in the most imminent peril."

The moral consequences attributed to epidemics a few centuries ago, are so discreditable to humanity as to appear almost incredible, and certainly do not appear in the present age. The accounts transmitted to us concerning the black plague, which appears to have resembled yellow fever in many respects, show that demoralization raged equally with the epidemic;—all the ties of friendship, of blood, of morality and of religion were dissolved, or merged into brutality, sensuality and licentiousness. [Ozanam. Hist. Méd. iv. 87.] The world must have grown better. Nowhere, least of all in New Orleans, is such a sad picture of humanity seen as having any connection with epidemic visitations;—instead of demoralization, benevolence illustrates the dreadful march of death, and sheds its sunshine upon the closing scenes of life—the supreme hour of dissolution.

The deplorable scenes of demoralization which medical historians have portrayed, as occurring in former times, had their origin, for the most part, in the fear of contagion, which led to the abondonment of the sick, and reckless conduct, under the belief that contagion and death would soon arrive.

The most hideous fictions were propagated in distant cities concerning the conduct of the citizens of New Orleans, during the epidemic which has just completed its orbit. A Journal, published in an Eastern city, where yellow fever once prevailed, but now happpily exempt, holds the following, as well as still more objectionable language, concerning New Orleans, in 1853: "Doomed city of the dismal swamp, abode of death! Immense charnel house. * * * Those who are safe, who have been enveloped in the plague-sheet, and have been set loose armored against a future attack—eat, drink, and are merry, almost persuaded of immunity from all disease, since preserved against that which is the most dreaded of all. * * * * * Cheeks not blanched by the proximity of ! "*la mort inexorable.* * * * Hear other hammers than those battering down coffin-lids. * * * Carriages pass and repass not belonging to the funeral *cortege*. The drivers of hearses are not more lugubrious than draymen and porters. 'I'm safe—I've had it,' etc. The "*safe*" portion of the population, instead of having been indifferent to the sick, or devoting themselves to balls, operas, and theatrical amusements, as represented by those misinformed journalists, devoted themselves to the well-being of the afflicted and poor.

The wind which blows out a small taper, kindles up a large fire among more substantial materials. In New Orleans the fire of charity burned but the more brightly as the storm of pestilence augmented. In these days of mourning, disaster and death, the only pleasure in which the citizens actively engaged, was the melancholy one of attending on the sick, of soothing the dying, and of closing the eyes of the dead. Many, very many availed themselves of the opportunity to perform these offices of charity, quietly, steadily, devotedly!— Charity.

"Like as a star,
That maketh not baste,
That taketb not rest,
Was each one fulfilling
His God-given Hest."—GOETHE.

If New Orleans has not the credit abroad, for having deported herself nobly, and conformably to the highest requirements of sacred humanity, amid the exigencies of a terrible calamity, it is owing to misrepresentation, and not to a lack of merit. She may more easily excuse the undeserved reproaches of distant strangers misled by false rumors, than some ungrateful recipients of her kindnesses at home. But silence is not less meritorious than positive beneficence. Bereavement.

The shades of death have just gathered over at least 8,000 yellow fever victims in New Orleans! *Eight Thousand!* A brief enumeration, yet it contains volumes of wretchedness—long anuals of bereavement, of widowhood, of orphanage—full of unutterable griefs, solitude, destitution—sad Souvenirs of the Past! Cheer less preludes to the *sombre* Future.

There is something ineffably melancholy in reviewing the fate of a large class of strangers, whose names and fatherland none knew. The poet has sought by the presence of friends to soothe the dyiug—

"On some fond breast the partlng soul relies,
Some pious drops the closing eye requires."

But many died unwept and unknown. Their coffins piled up two or three tiers deep like wood, were carted to the grave in the cypress plain—

Receive them, unrelenting Grave!—

"Strong are the barriers round thy dark domain—
And fetters sure and fast,
Hold all that enter tby unbreathing reign.
"In thy abysses bide
Beauty and excellence *unknown*; to thee
Earth's wonders and her pride
Are gathered, as waters to the sea."

Contrasts.

The earth, air, and sky seemed to be in the midst of the pestilence; such as Goethe described, which appear in the strongest contrast, when humanity is desolated:

"Know'st thou the land where the pale citron grows,
And the gold orange through dark foilage glows?
A soft wind flutters from the deep blue sky,
The myrtle blooms, and towers the laurel high.
Know'st thou it well?
"O there with thee!
O that I might, my own beloved one, flee!"

Yet, in the midst such scenes the Angel of Death poured out the phials of his wrath. Coffin rumbled after coffin; the funeral columns defiled almost constantly for months from every street

"To join
The innumerable caravan that moves
To the pale realms of shade."

Sun-set.

As the day declined the funeral march became dense, continuous, and often blended. It was then that nature was serenest, while the sun was sinking into the cypress forests, his slanting rays dying with variegated hues, the trembling waves of the river, recalling to mind the sublime descriptions of Scott and Goethe; the first relating to a tropical sun-set, and the second one in the temperate zone:

"No pale gradations quench his ray,
No twilight dews his wrath allay;
With disk like battle target red,
He rushes to his burning bed,
Dyes the wide wave with bloody light,
Then sinks at once—and all is night."

"See how the green-girt cottages shimmer in the setting sun! He bends and sinks. Yonder he hurries off and quickens other life. Oh! that I have no wing to lift me from the ground, to struggle after, forever after him! I should see, in everlasting evening beams, the stilly world at my feet,—every height on fire,—every vale in repose,—the silver brook flowing into golden streams. * * * I hurry on to drink his everlasting light,—the day before me and the night behind—the heavens above, and under me the waves."

Poetry of the pestilence.

These contrasts between the beauty and repose of nature, and the march of death, gave rise to several poetical contributions, which were cut short in some cases by "the pest-king," whose power they were recording—the muse, trailing her fast-failing wings in the polluting streams of blood and black vomit:

———————"All hoping is past!
The black draught of Death is ejected at last!"

So reads one of the unfinished black vomit poems of 200 lines, by a physician' who died of the *vomito*, which he sung.

Another says:

"The sun sinks down o'er each death-crowded street,
Whilst dread, delirious screams the hearing greet;
Night settles o'er with awe and fear and gloom.
What means yon glaring blaze, yon cannon's boom?
Ha! victory's tokens for the conqueror Death!
Who slays his thousands by the *fever*'s breath!"

Night.

Night was ushered in, for a short period with cannonnading, and, for a considerable time with conflagrations from burning tar, the towering flames of which, cast a sickly, flickering light among the streets, upon the river, and into many a delapidated window upon yellow, rigid corpses, awaiting interment on the morrow.

CHAPTER XVII.

TABLEAU ANTE-MORTEM AND POST-MORTEM.

Although I have not witnessed the romantic novel reading, love making, and merry doings of yellow fever patients at the very close of life, as described by several writers in Mobile and New Orleans, yet I have seen many examples in which the more sober pursuits of business, and plans for the future, were discussed by sane persons but a few hours, or even only minutes, before death. Dr. Cartwright, in his account of the epidemic yellow fever at Natchez, in 1823, says that "in the last stage, in which *fever* in its etymological sense of the term disappeared and all severe pain, the patient, before debilitated, often regained his strength so far as to be able to walk about the room. When there was no evident cause for these two symptoms they invariably portended a fatal termination. A shoemaker, the the day before death, got out of bed, went to work, and nearly finished making a shoe." (Med. Rec.) He says that in the hospital four or five patients, in the last stage of the disease, acquired great strength, left their beds, got brooms and the like, and after parading through the rooms, died suddenly.

M. Robin, in his travels in Louisiana, from 1802 to 1806, mentions the case of a physician attacked with yellow fever, who unconscious of any sickness, continued to attend his patients until just before death. When interrogated, he declared he was in good health (fort bien—fort bien); while others died in rapture (dans le transport).

There is probably no violent, acute disease less painful than yellow fever, although there is none scarcely more repulsive to the beholder, as seen in the black-vomit, in enormous hæmorrhages from the mouth, nose, ears, eyes, and even the toes; the eyes prominent, glistening, injected, yellow, and staring; the face discolored with yellow and dusky red.

Without trenching too much on professional ground, let us approach the yellow fever corpse and throw off the winding sheet so as to expose the face, chest and arms. The poets, true to nature, have often found in the physiogomy or anatomical expression of the dead, much beauty—

> "Lips bland and beautiful"—
> "Eyes
> So fair, so calm, so softly sealed
> The first, last look of death revealed."

"It has been observed," says Professor Dickson, "that the countenances of those killed by gunshot wounds are usually placid, while those who perish by the sword, bayonet, pike, or lance, offer visages distorted by pain, or by emotions of anger or impatience."

Eckerman closes his "Conversations with Goethe," the great poet of Germany with the following tableau of his dead body:

"The morning after Goethe's death, a deep longing seized me to look yet once again upon his earthy garment. His faithful servant, Frederic, opened for me the chamber in which he was laid out: Stretched upon his back, he reposed as if in sleep; profound peace and serenity reigned in the features of his noble, dignified countenance; the mighty brow seemed yet the dwelling-place of thought. I wished for a lock of his hair, but reverence prevented me from cutting it off. The body lay naked, only wrapped in a white sheet; large pieces of ice had been placed around, to keep it fresh as long as possible. Frederic drew aside the sheet, and I was astonished at the divine magnificence of the form. The breast was so powerful, broad, and arched; the limbs full, and softly muscular; the feet elegant, and of the most perfect shape; nowhere on the whole body a trace either of fat or of leanness and decay; a perfect man lay in great beauty before me; and the rapture which the sight caused made me forget for a moment, that the immortal spirit had left such an abode. I laid my hand on his heart—there was a deep silence—and I turned away to give free vent to my tears."

The physiognomy of the yellow fever corpse is usually sad, sullen and perturbed; the countenance dark, mottled, yellow, livid, stained with blood and black vomit, and swollen; the eyes prominent and blood shotten, and yellow. The veins of the face and of the whole body often become distended, and various and very curious phenomena may be discovered upon a closer inspection,—a few of which may be enumerated on this occasion;—among these is the circulation of the blood, which, independent of the heart, seems to be in some few cases, as active as in life. The following example selected from many will illustrate this new fact:

The experiments began twenty-five minutes after death, and continued one hour and thirty minutes, the history of which fills ten pages; from these the following extracts are taken: A thermometer remained in the armpit 55 minutes; the first five minutes gave 105°; five minutes 106½°; five minutes 108°; ten minutes 108°; ten minutes 108°; ten minutes 108°; ten minutes 108¼°; pelvic region seven minutes 111°; five minutes 111°; five minutes 110°; stomach 109¾°, chest 107°, etc. Great distension of the veins. A ligature was placed on the arm, a vein was opened, about two ounces of blood jetted out, after which a trickling took place for a considerable time, amounting, by estimation, to twelve ounces. The circulation was found to be very rapid about the head; (the patient had died suddenly with apoplectic symptoms;) the skin of the face and neck was injected, dark, livid and somewhat mottled, there was no cadaveric hyperæmia or injection of the dependent parts; the external jugular veins were distended as if ready to burst. Greater tension I had never witnessed in glottidian œdema, nor in convulsions, nor in the last throes of parturition. The left jugular was opened, as for ordinary bloodletting, *but no bandage or pressure* was used, the head being raised, so that the orifice was nearly on a level with the breast bone. The blood jetted completely, without wetting the skin, forming an arch, the diameter of which, continued to extend for five minutes; at the end of eight minutes the arch had contracted, owing, apparently to small clots on the margins of the orifice, and the skin having once become wet, the blood, without being materially diminished, ran down the neck, jetting occasionally on removing clots from the orifice. For about one hour the flow was copious, but, at the end of that time, was diminishing rapidly. I caught nearly three pounds at first, but as much of it did not jet out, but ran down the neck, I could only estimate the amount (which I did) at five pounds, or eighty ounces from the jugular alone. As the bloodletting progressed, the congestion and discoloration of the skin of the face diminished.

Now it will be seen, that the orifice in the jugular did not discharge the blood as fast as the circulation replaced it—there was a surplus, because, the venous tension or jetting augmented for five minutes, and had not ceased during eight minutes. There was, as already mentioned, no bandage or pressure. It is fair to presume, that it would be quite impossible in this way, to bleed a living man, half as much, as collapse of the vein, clots, fainting, etc., would prevent it. Hence, the circulation in the veins was probably more active and persistent, than in health! Let it be supposed that the upper or *distal* end of the jugular, contained one ounce, when opened—this being discharged, no more could replace it, only by a circulatory force. But here, the tube is filled eighty times in a few minutes.

The heat of the patient in the early stage of yellow fever is usually very great, but it falls off towards the close of the disease, in both the convalescent and dying stages; but, among the dead, in many cases, it rises higher than in life, from a quarter of an hour to six or seven hours after death, rising (sometimes to 113°) and falling in the very same and in different regions both internally and externally. The laws of this heat do not fall under those belonging to physiological, morbid, physical, or chemical caloric, as now recognized in these sciences; they constitute, therefore, a separate branch of thermotics entirely new. This heat, after death, is not peculiar to yellow fever snbjects. Nor are the following phenomena: Let an arm of the corpse be straightened out at a right angle to the body and be slapped with the operator's hand or a piece of board, in the proper place, between the shoulder and elbow, whereupon the corpse will continue, in many cases, at intervals, for hours, to raise its arm from the floor through the vertical, from which the hand descends to the upper surface of the trunk, generally resting on the breast, or face, being sometimes sudden like a blow or slap. From one to five-pound weights are thus raised, if tied in the palm, and carried to the breast. The palm thus loaded cannot return to its original or extended position without aid; but if replaced, will repeat its motions, as proved by many hundred experiments which would fill more space than this memoir.

The following summary of these facts, so far as published, is so compendious, that I beg leave to give them, from a recent work "on Life, Sleep, Pain and Death," by Professor Dickson, of Charleston, an author who for scholarship, and voluminous concontributions to Medicine, occupies the first rank in our literature:

"The researches of Dr. Bennet Dowler, of New Orleans, have presented us with results profoundly impressive, startling, and instructive. He has, with almost unequaled zeal, availed himself of opportunities of performing autopsy at a period following death of unprecedented promptness, that is, within a few minutes after the last struggle, and employed them with an intelligent curiosity and to admirable purpose.

"I have said that, in physiological death, the natural decay of advancing age, there is a gradual encroachment of death upon life; so here, in premature death from violent diseases, the contrasted analogy is offered of life maintaining his ground far amidst the destructive changes of death. Thus, in cholera asphyxia, the body, for an indefinite period, after all other signs of life have ceased, is agitated by horrid spasms, and violently contorted. We learn from Dr. Dowler, that it is not only in these frightful manifestations, and in the cold stiffness of the familiar *rigor mortis*, that we are to trace this tenacious muscular contraction as the last vital sign, but that in all, or almost all cases, we shall find it lingering, not in the heart, anciently considered in its right ventricle the *ultimum moriens*, nor in any other internal fibres, but in the muscles of the limbs, the biceps most obstinately. This muscle will contract, even after the arm with the scapula has been torn from the trunk, upon receiving a sharp blow, so as to raise the forearm from the table.

"We also learn from him the curious fact, that the generation of animal heat, which physiologists have chosen to point out as a function most purely vital, does not cease upon the supervention of obvious or apparent death. There is, he tells us, a steady development for some time of what he terms "post-mortem caloricity," by which the heat is carried not only above the natural or normal standard, but to a height rarely equaled in the most sthenic or inflammatory forms of disease. He has seen it reach 113° of Fahr., higher than Hunter ever met with it, in his experiments made for the purpose of exciting it; higher than it has been noted even in scarlatina, 112°, I think, being the ultimate limit observed in that disease of pungent external heat; and far beyond the natural heat of the central parts of the healthy body, which is 97° or 98°. Nor is it near the centre, or at the trunk, that the post-mortem warmth is greatest; but, for some unknown reason, at the inner part of the thigh, about the lower margin of its upper third. I scarcely know any fact in nature more incomprehensible or inexplicable than this."

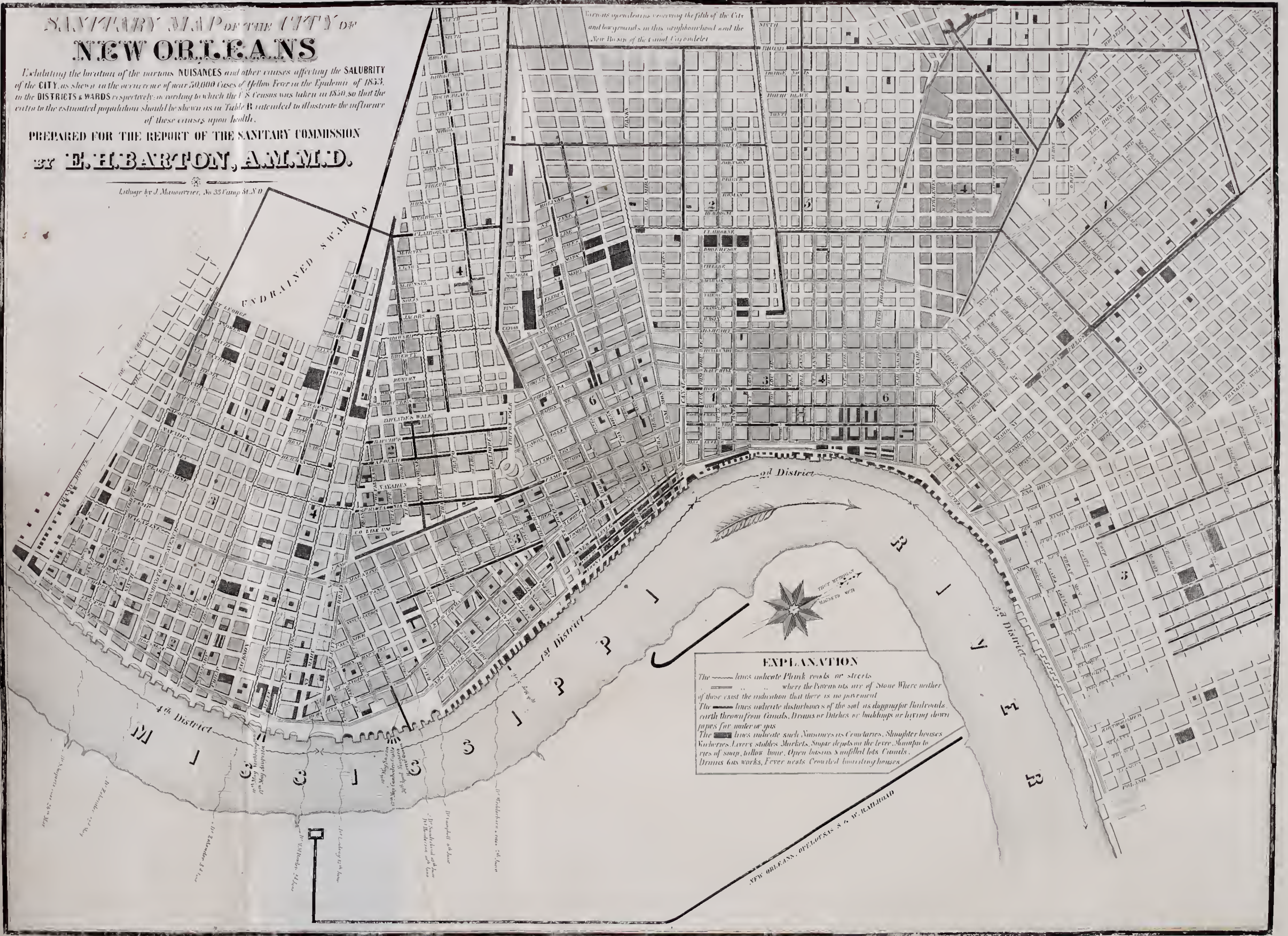
Independent of experience, the physiologist cognizes no inherent necessity in life itself, nor in any of its organized forms of manifestation, nor in any of its structural adaptations and finalities, for a catastrophe so melancholy—so repugnant to the instincts of humanity, as death. Indeed the analogies of the material universe wherein stability reigns, or varies only in constantly recurring cycles, seems to teach that man, for whom all things appear to exist, is, what his irrepressible instincts claim, immortal—exempt from death! The stars rise undiminished as on the morning of the creation, and "pursue the even tenor of their way" through infinite space. The earth, a little scarred on its face by volcanic irruptions and accidents, is undecayed by age, "spins silently onward with spheres which never sleep;—her unwithered countenance being as bright as at creations' day." Trees live thousands of years, and some fishes for centuries. The inferior animals neither foreknow, nor apprehend impending death at every step in life. This unpleasant secret is made known to man alone. A current, he can no more resist than the unfortunate boatman caught by the descending rapids of Niagara, hurries him over a precipice into a realm as tenebrious, (after all the researches of mere physical science,) as that into which the fabled Styx debouched in the days of antiquity.

Poets and philosophers have sought to bring out in the foreground pictures more cheering, so as to veil the sombre tableau of death in the distance.– Bryant's picture is one of the most pleasing:

"So live, that, when thy summons comes to join
The innumerable caravan, that moves
To the pale realms of shade, where each shall take
His chamber in the silent halls of death,
Thou go not like the quarry slave at night
Scourged to his dungeon; but sustained and soothed
By an unfaltering trust, approach thy grave
Like one who wraps the drapery of his couch
About him, and lies down to pleasant dreams."

With unsurpassed beauty, La Fontaine calls death the evening of a fine day:

La mort est le soir d'un beau jour.


SANITARY MAP OF THE CITY OF
NEW ORLEANS
Exhibiting the location of the various NUISANCES and other causes affecting the SALUBRITY of the CITY, as shewn in the occurrence of near 30,000 Cases of Yellow Fever in the Epidemic of 1853, in the DISTRICTS & WARDS respectively: according to which the U.S. Census was taken in 1850, so that the ratio to the estimated population should be shewn as in Table B intended to illustrate the influence of these causes upon health.
PREPARED FOR THE REPORT OF THE SANITARY COMMISSION
BY E. H. BARTON, A.M. M.D.
Lithogr by J. Manouvrier, No 33 Camp St. N.O.
UNDRAINED SWAMPS
1st District
2d District
3d District
4th District
MISSISSIPPI RIVER
EXPLANATION
The lines indicate Plank roads or streets
where the Pavements are of Stone Where neither of these exist the indication that there is no pavement
The lines indicate disturbances of the soil as digging for Railroads, earth thrown from Canals, Drains or Ditches or buildings or laying down pipes for water or gas
The lines indicate such Nuisances as Cemeteries, Slaughter houses Vacheries, Livery stables Markets, Sugar depots on the levee, Manufactories of soap, tallow bone, Open basins & unfilled lots Canals, Drains Gas works, Fever nests Crowded boarding houses
NEW ORLEANS, OPELOUSAS & G. W. RAILROAD

THE

CAUSE AND PREVENTION

OF

YELLOW FEVER

AT

New Orleans and other Cities in America,

BY

E. H. BARTON, A. M., M. D.,

CHAIRMAN OF THE SANITARY COMMISSION; LATE PRESIDENT OF THE LOUISIANA STATE MEDICAL SOCIETY AND OF THE NEW ORLEANS ACADEMY OF SCIENCES; LATE CHAIRMAN OF THE COMMITTEE ON EPIDEMICS OF THE AMERICAN MEDICAL ASSOCIATION; CORRESPONDING MEMBER OF THE EPIDEMIOLOGICAL SOCIETY OF LONDON; FORMER PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE AND CLINICAL PRACTICE IN THE MEDICAL COLLEGE OF LOUISIANA, &c., &c., &c.

"*Quod sol atque imbres dedirant, quod terra crearat sponte sua.*"—LUCRETIUS, LIB. V.

THIRD EDITION,

With the addition of upwards of seventy pages of "PREFATORY REMARKS,"

AND A SUPPLEMENT.

NEW YORK:

H. BAILLIERE, 290 BROADWAY.

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1857.

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INDEX TO PREFATORY REMARKS.

TO SECOND EDITION.

INDEX TO PREFATORY REMARKS TO SECOND EDITION.

ERRATA.

"In Special Instructions of the Sanitary Commission."

Insert Alex. Campbell, United States Consul at St. Pierre, Martinique, after Bolivia, in fifth line from bottom, page 5.

In Index to the Report of the Sanitary Commission.

Insert 98 for "68," at sixth line from bottom page 2.
Insert "Death's harvest's fields," after thirteenth line from top page 6.

For "Additional Errata in Body of the Report."

For "members" read *numbers*, in sixteenth line from bottom page 6.
For "Thermometor" read *Barometor*, at fourth line from bottom page 20.
Insert *that* after "proves," at sixth line from bottom page 62.
Insert "and cutting down the banks of the river, and spreading the materials on the streets—and at a subsequent year *wherever* there were these exposures of earth, there and almost there alone, the fever broke out; to follow "offensive," seventeenth line from top page 107.
Read *ever* for "never," at fifteenth line from top page 132.

Additional Errata in the Body of the "Report on the Sanitary Condition of New Orleans."

In table 2, "last of acclimation, for average for United States and British America, for 12.39 read 29.11, page 36.
Do., for average for Europe, for 111.91 read 146.45, page 36.
For "record" read records, at seventeenth line from bottom page 50.
For "The statement of," read *To state*, at tenth line from bottom page 50.
For "from" read *by*, at eleventh line from top page 51.
Erase "condition" at twelfth line from bottom page 51.
Insert *that* after prove, at sixth line from bottom page 62.
For "compels" read *compel*, at thirteenth line from bottom page 67.
For "has written" read *wrote*, at line fifteenth from top page 83.
For "has" read *have*, at line thirteenth from bottom page 87.
Insert *a* before "dew," at line sixth from bottom page 87.
Insert the following note to sixth line from bottom:—"This I have since shown is not the fact, but that it is the effect of high temperature with *saturation* only," at page 88.
For "extends" read *extend*, at line seventeenth from top page 92.
For "it" read *its*, at fifth line from bottom page 94.
Insert *we* after "and," at fourth line from bottom page 94.
Erase "five times that amount here" and insert 627 [illegible]000, and on an average of several years more than one-third, at page 172.
Erase "two-thirds" and insert *three-fourths*, at twelfth line from bottom page 202.
Erase "nature" and insert *influence*, nineteenth line from bottom, and for "fellow" read *fever*, page 200.
For "renewal" read *removal*, at fifteenth line from top page 207.
Insert *of moisture* after "amount," at twelfth line from top page 211.

For "securcd" read *severed*, fourth line from bottom page 224.
For "parts" read *ports*, twentieth line from bottom page 226.
For "Manoxyrinal" read *Monoxyrimial*, at eight line from top page 239.
Insert *respectively* after "burthens," at ninth line from top page 249.
For "200,000" read "2,000,000," at fourteenth line from bottom page 247.
For "men" read *even*, at second line from top page 247.
After line seven insert "In sandy soils the filth is sinking into the soil, remains there until brought into activity when suitable atmospherical conditions supervenes," page 227.

In Table of Contents to Supplement.

Erase "primitive" and insert *preventive*, in eighth line from bottom page 257.
Erase one of the "theres" at sixth line from top page 260.
Insert *be* at line sixth after "an," page 262.
Erase "two-thirds" at line fifteen from top, and insert *three-fourths*, page 263.
After "extensive," at line fifteen from top, insert *cross streets*, page 268.
Erase "53," at line sixteen from bottom, and insert 54, page 272.
Erase "information," at line eight from top, and insert *inundation*, page 273.
After "instance," next line, insert *of which*, at eighteenth line from bottom, after "have," insert *here*, page 274.
At second line from top, for "atmoic" insert *atomic*, page 276.
Erase "which," at seventeenth line from bottom; for acclimated on bottom line, read *unacclimated*, page 283.

In Prefatory Remarks to Second Edition.

For "Wm. Elam, Esq.," at bottom of page, read *J. M. Elam, Esq.*, page 6.
For Dr. N. W. Gibbes," at botton of page, read Dr. Robt. W. Gibbes, p. 7.
For "countries," at line fourteen from bottom read *sources*, page 8.
For "doubtless," at line ten from top, read *unquestionably*, page 9.
Erase "to" at line from bottom, after "pro-tanto, page 9.
Erase "external" after "disease," line second from top, page 10.
Insert *I* at line fifteen from top, between "me" and "in," page 10.
Erase "and" at line 9th from bottom, preceding "it is," page 10.
For "capalaries," read *capillaries*, in fourth line from top, page 11.
Insert *to* after apply, at tenth line from top, page 16.
For "may produce," read *produces*, at ninth line from bottom, page 16.
Erase "and" at last line from bottom, page 16.

Errata in Prefatory Remarks to Third Edition.

Erase "to" and substitute *and*,' eleventh line from bottom page 11.
Insert *even* after "immunity," eight line from bottom page 11.
Erase "actual," second line from bottom page 11.
Erase "saw" and insert *felt*, twenty-seventh line from bottom page 14.
Erase "form" and insert *from*, tenth line from top page 18.
Erase "ever" and insert *men*, ninth line from top page 37.

PREFATORY REMARKS

TO THE THIRD EDITION.

ANOTHER edition of this Report being required, the reporter embraces the opportunity to consider all the points raised and objections made to the original that he has met with, which have not been satisfactorily replied to in the second edition, and to add such further information in relation to the causes of the occurrences of yellow fever, in other places, as he has been able to procure, in illustration of the principles set forth in the Report.

The Report upon the Sanitary condition of New Orleans was prepared for the use, and under the special direction, of the public authorities. Its main object was an investigation into the *circumstances and conditions causing and influencing yellow fever*, so as to predicate upon them sanitary and preventive measures. It is believed they have been fully pointed out, and that the *causa sine qua non* of yellow fever, as a basis upon which to erect sanitary and police ordinances, are amply laid down. It was not then deemed necessary, in the elucidation of the subject, to go extensively into the *causa causans*. Sufficient, however, was said to indicate the general views entertained. It is now my object to explain them more fully, to answer such objections as have been raised against them, and to fortify assailed points.

My first object is to set myself right—to be thoroughly understood. I have before corrected some of these misinterpretations.

It was never said then—1st. "That disturbing the soil" alone would produce yellow fever—or that there would or could be no yellow fever without it. I likened this to the disturbance or presence of all decomposed or decomposing organic matter—may be aggravated—as there had been no great disturbance without an epidemic *here.*

2d. It was never said that a high dew-point always produced yellow fever, or that it was rife in proportion to its elevation—but that a high dew-point was essential to its existence and duration, and that whenever it fell to a certain degree, the *epidemic* uniformly fell here, and I believe elsewhere, as is shown at Savannah, Charleston, &c.

My position is, that an elevated temperature and dew-point, with much disturbance of the soil, or its equivalent, a large amount of filth and abnormally elevated solar radiation, continued for a certain duration, are all requisite to meet *in combination* (not one alone, nor in proportion to the extent of any one) to constitute that atmospheric condition necessary for the origination of *epidemic yellow fever.* I reiterate it now.

In all the discussions to which the subject-matter and principles involved in the Report have given rise, there are but two upon which there seems now to be any skepticism.

1st. In relation to the requirement of a high dew-point for the origination of yellow fever, and

2d. As to the necessity of some "specific poison" for its existence, "whose nature is extremely indefinite, and whose origin is deemed very obscure."

The respectability of the quarters whence these emanate is entitled to great consideration, and I rejoice at any opportunity to clear up what may have been left obscure—to give farther illustrations and explanations, and to remove difficulties upon a subject on which there has actually been so *little experience*, or rather experiments, as to the direct application of climatic conditions to the origination, production and evolvement of zymotic disease.

It seems necessary for me now to repeat, *in limine*, what I have so often done already, that my remarks apply to that aggravated condition giving rise to EPIDEMIC YELLOW FEVER. Endemic and sporadic cases usually depend upon *local circumstances* and *conditions*, which no general experiments can either prove or disprove.

The *only real case*, brought forward to test the principles involved (of the necessity of a high dew point), is that mentioned by Dr. La Roche, in his truly great work on yellow fever, as occurring in Philadelphia, in 1853. Now here, really, there is no applicability whatever—for

1st. There was *no epidemic.* 170 cases (and 128 deaths) is no more a proof of an epidemic in a population of near half a million of souls, than the appearance of one swallow is to constitute a summer.

2d. If there was an epidemic, the experiments were not made where the disease existed, but a mile or so off, in a high, dry, healthy locality, where a different air must necessarily have existed.

The estimated difference of temperature according to elevation, gives near one degree less for every hundred yards of ascent; it is actually much greater from constant experience. So a difference of elevation gives a still greater difference in the hygrometric condition. The following decisive experiment of Prof. S. B. Hunt, at Buffalo, beautifully illustrates this.*

	Temp. of the air.	Temp. of evaporation.	Relative humidity.	To which add No. of grains to each cubic foot.
At the surface, -	49.	34.4.	.616.	2.634.
At 60 ft. elevation, in belfry of church.	38.	23.9.	.487.	1.677.

All observant people know that there is a sensible difference in the few feet between one story and another, and although the above difference appears small in figures, it is really very great. So a difference in a city from the damp neighborhood of the wharves, to humid slips with an exposed surface at every tide, to a high, dry, well-paved neighborhood, not crowded with houses, must be very considerable. The effect of these elevations on cholera, has been repeatedly shown to be very striking in London, as well as Buffalo, and elsewhere. This is so well known in yellow fever, that it rarely ascends hills, but is usually confined to low places in cities; and indeed, there is often found entire immunity in an upper story. In a low and alluvion country—on the banks of the Mississippi—where all is moist, with the winds blowing over immense swamps, the difference would not probably be so great, although we often find the disease confining itself to one of these localities, without attacking the other, as at Bayou-Sara, Natchez, Vicksburg, &c. Now this is the actual fact, which I have found by actual experiments in this city, at elevations varying from four feet above the soil, to upwards of 200 feet, and I have

* Vide Buffalo Journal for Nov. 1855.

not found the difference half so great as Prof. Hunt found at Buffalo, in a different geological region.

No condition which is not present can be properly referred to as influencing morbid action. This is eminently true of the hygrometric, which may be limited to a neighborhood, lot, cellar, sink, slip, sewer, &c. Of course these experiments, made a mile off, would be about as applicable as the hygrometry of the hills 60 or 80 miles from New Orleans, would be to apply to any supposed influence here.

3d. The dew-point (in the subject of comparison) was taken erroneously, as conclusively shown by Prof. Hunt.* It differs more than 11° from the standard now acknowledged as correct.

After an epidemic has lost its wide, pervading character, from the general causes producing it, having lost their aggravated condition, or intensity, endemic or sporadic cases continue to occur—these become more and more confined to limited localities, dependent upon local circumstances and conditions, and are not cognizable by or amenable to general atmospheric experiments, and would seem to be almost independent of them. This explanation applies particularly to cases of yellow fever, occurring after the thermometer and dew-point have descended below the point I have indicated as their range here, and even after frost. There are few winters in this city, in which more or less of that form of disease, accompanied with black vomit, has not occurred.

So much, then, for the *only instance* where hygrometric experiments have been referred to, to *directly* disprove records that have been made successively here for a long series of years.

It is now proper to meet objections nearer home, and which may have an influence from that cause, which I humbly think they will not be found entitled to, on examination. The record I offer to sustain me in my positions was made, in great part, years before their applicability to the subject before us was thought of.

Long experience and repeated trials to reconcile assertions with recorded fact, have warned me against placing any confidence in averments *from memory* about the existence of any particular kind of weather having occurred at almost any past period, however little

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* Vide supra.

soever remote. I say this without impugning the veracity of any one. For instance, it has been stated here in the public prints as an objection to these views, of humidity being essential to the existence of yellow fever, that "during the epidemics of 1837, '39, and '41, it was remarkably dry." On recurring to the record, it was seen that although the *aggregate* for the first year showed a very small average for the entire year, the yellow fever months exhibited an unusual quantity, and that during the years 1839 and '41, not only were the yellow fever periods remarkable for immense precipitations, but they showed in the aggregate of each year, an *amount of rain rarely if ever equalled in this country.* Precisely the same occurred in relation to the statement of "the deluges of rain falling in 1825," and onwards to 1829--mentioned in the "Supplement," page 264. As I could, at the time of answering, obtain no intelligence of any record of rain being kept in New Orleans at the period referred to, I could only reach my results by the very laborious method therein pointed out--being convinced for the reasons set forth, that the whole period had been *remarkably dry.* That opinion has lately received a most remarkable and unexpected confirmation from Mr. D. Blair, of this city, who states to me, that he then kept a rain guage, which was a very fine, costly one, from London, and the precipitation was recorded in a book, which has been since lost; but it was so remarkable as induced him often to refer to it, and that the rain during the first mentioned period was so small in some of the years as only to amount to 27 inches, (I have never recorded one less than 39 inches,) and during 1829 there fell 90 inches! the heaviest amount of rain which has ever fallen here, or recorded by any authority entitled to credibility.*

a But the statements to which I now more particularly invite atten-

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* It is true a journal was kept here by the late Mr. Lillie, keeper of a store for nautical charts, and published in the New Orleans Medical and Surgical Journal, the editor of which I often warned against its fallacious statements—a record so apocryphal that it would not be even referred to, had it not been quoted by Dr. La Roche, to show the immense quantities of rain some years precipitated here without very seriously impairing the public health, and he refers to this journal as proof of it, in recording the outrageous amount of 127,247 inches as having fallen during 1848, while my own rain guage for half that year, and that kept for the War Departmhnt for the other half, only amounted to 49,144 inches! Ex uno disce omnes.

There is, however, another serious error made in this journal, which I shall refer to, as it has been quoted by Dr. Drake, and gives foundation for another erroneous opinion of our climate, in stating its main temperature more than three degrees (3.31) higher than it is. He made it 71.18—my own observations make it 67.84. This is corroborated by the temperature of the artesian well in Canal street.

tion were those made by Dr. W. Stone, of this city, before a learned body of physicians of New York, in which he expressed the opinion that "moisture was not essential [for yellow fever], for it raged equally in the high lands and the low—where the *dry trade winds blow*, or where the air was damp."†

b "A continued heat in a certain high degree was once supposed essential; but this is now disbelieved, for in 1847 it commenced early, in '53 earlier—say in latter part of May or June, when there was no steady heat. We had a remarkably cold spring that year."

c "This year [1855] it was very dry, and the sugar cane died for want of moisture, and all were suffocated by dust when the disease first appeared."

d "It appears in *all climates* that are *almost perfectly healthy*, where there are no remittents or intermittents, nothing but accidental sickness."

e "Filth does not appear to give any virulence to the disease."

"Many who investigate yellow fever form theories and afterwards hunt for facts, and they are apt to get hold of instances which favor their theories. These when arranged in a catalogue appear quite formidable, but when investigated, quite a different result is obtained."

These statements I would not have noticed, had they been derived from an authority less distinguished; but coming from the source, they did, and uttered ex cathedra, before a body of medical savans, in the face of records and experiments, most of which are now before the world, I am in duty bound, not only out of self-respect, but what I owe to my colleagues, to defend the positions I have ushered forth with my name.

a. Contains nothing but assertions, and *all equally true!* whether of the "Dry tradewinds" which no one ever saw in this hemisphere, or "where the air was damp or dry," and is met by the statement I aver to be true, and which I will prove presently, that yellow fever *never originated but with a high dew-point.* The presence or absence of rain is not sufficient to indicate moisture or dryness, as I will soon demonstrate.

b. A high temperature of many weeks, if not of months duration,

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† Vide Records of the "Academy of Medicine" of New York, published in the New York "Medical Times" for November, 1855, No. 556.

is essential for the origination of epidemic yellow fever, as *every record of its appearance* will most abundantly testify.

The first published record of yellow fever in 1847, occurred in the week ending the 10*th of July*; but the fever did not become epidemic until the first week in August. In 1853, there were two cases in May—31 in June; but the fever did not assume an epidemic character until about the *middle of July.* So far from being a "cold spring that year," it *was exactly the reverse*—the average temperature being more than one degree higher than any spring *for eight* preceding epidemics!

Now, although the spring of '53 was warmer than those of preceding epidemic years, yet I draw no deduction from it, because it did not exceed the average of the preceding thirty-five years. So the temperature of a preceding spring can hardly form a proper basis to predicate an approaching epidemic on. Neither, on examination, can the temperature of a preceding winter. Epidemics have followed mild as they have severe winters, as well as springs,—neither, then, furnish a clue to enable us to announce, with any certainty, the future yellow fever. An abnormal amount of solar radiation is probably the most conspicuous in the line of meteorological causations. There is doubtless a law of definite duration wherever time is an important element, as it is in yellow fever; yet here the period of maturation cannot be at present defined. High temperature alone, although indispensable, is hardly so important an element in the production of yellow fever as moisture. Of this—one of the most influential agents, it is mainly required that it should exist but a few weeks before, and during the disease. These *views are founded upon, and sustained by an examination of all the records which existed antecedent to, and during all the years of our epidemics.*

So far then as the temperature and moisture of the air is concerned, no anterior condition of either—occurring long before-hand, can, with certainty, assure us of what is in future (here). The combination to produce yellow fever must be formed during its incipiency and not long previous—if experience here is to be a guide. This is corroborated by the fact, well known, that an unacclimated individual, perfectly healthy, visiting a place where epidemic yellow fever is reigning, is sometimes attacked in a few hours, and from that to a few days; at all events, requiring but a brief duration to produce its influence, instead of months of preparation.

The foundation of all scientific prediction is, that an occurrence once happening, dependent upon certain well ascertained contingencies, may be foretold upon the basis of their repetition; thus it is known that a certain flower will bloom when the sum of the squares of the daily mean of temperatures reaches a certain point from the last freeze of winter; for instance, the common lilac blooms, when this sum reaches 7607° Fahrenheit; and again, the result will follow, if certain causes known to be the productive of the disease, (with the additional element—constitutional liability) unite in the requisite proportions.

The prediction of the epidemic yellow fever of 1853, was not and could not be on meteorological grounds alone, for the reasons above stated—they were not and could not be known with sufficient definiteness beforehand; the contingency of *their* happening was the only doubt entertained—for nearly all my grounds were based on the presence of the other blade of the "shears"—the terrene, and such had not failed in the preceding sixty years. It was upon this that I was enabled also to announce, before-hand, the expectation of the epidemics of 1854 and '55.*

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* I make the following extract from the great work on yellow fever of my friend Dr. La Roche, ii., p. 405:

"To the credit of Dr. Barton it may be stated that so early as the 6th of June [last week in May] of that momentous year, he predicted the forthcoming fearful mortality of 1853. At a meeting of the New Orleans Academy of Sciences held that day, he exhibited a chart of the mortality of the city since 1787. Among many other interesting facts developed by the chart, [vide chart A], he called attention to some recorded above; 'and to the inquiry as to the probability of an epidemic during the coming season, he replied, that judging from the past, if the facts exhibited by the chart were not merely coincidences, he was compelled to apprehend that the present year would be MARKED by a great augmentation of disease. The simultaneous construction of four railroads in and around the city—the digging of a new basin of vast extent in the rear of the city—the enlargement of the canal Carondelet—the open sewers—scarcity of water—insufficient drainage, and the practice of spreading over the streets the horrible filth of the gutters to fester and reek in the sun—if all these are continued during the hot months, with the proper meteorological condition, our exemption from a SEVERE EPIDEMIC would almost seem MIRACULOUS.' "*

"Here let it be remembered, is an epidemic predicted on data of a positive kind by an experienced and observant physician; and when that epidemic arrives, some are found to attribute it to importation from abroad, and quarantine measures are suggested to guard against the further introduction of the disease."

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* Published proceedings of the New Orleans Academy of Sciences, i: p. 11.

The spring was dry, it rained but 4.790 inches, and the rainy period was only seven days and seven nights. But then during June there fell a larger quantity of rain than had fallen for ten preceding Junes, and including the following months of July and August not less than 17.559 inches of rain were precipitated, and it rained on *thirty-eight days* and *nine nights!* The first cases of yellow fever which were recorded or published, were not until the week ending the *9th of July!* The average relative humidity for June during which it rained more than half the time, was .774, average dew-point 70.72, average amount of moisture in each cubic foot was 8,289 grains—near our maximum. This statement, copied from the record, requires no comment.

The yellow fever occurring in this city early or late, depends *always* upon meteorological conditions. It never makes a turning point, nor does it cease as an epidemic in New Orleans *without a meteorological change*, and a reference to the records of every yellow fever epidemic which has occnrred in this country for more than half a century will sustain me. And again, the same want of precision is exhibited in the assumed period of the existence of epidemics. This period is known only when the causes productive of it are of such an aggravated nature as to influence the mass of cases—when it becomes the predominant form of morbid action—when other diseases either give way to it or wear its livery, and evidence of its existence is exhibited on the vegetable and animal creation beyond our race. A few cases may occur months before the actual epidemic can be declared—nay, exist all the season, or all the year, and there be no epidemic. The period of their duration is just as variable. The actual extremes have varied from fifteen to ninety days.

d and e. Require no answer; it is charity to suppose that he has been misquoted, if not, our Northern brethren must commence studying the therapeutics of yellow fever, and well then may our countrymen be alarmed at their future prospects, whether high or low, mountain or seaboard, cleanly or filthy? The subject is fully treated in the report, and especially in the supplement.

f. The only reply these ad captandum remarks call for is, 1st. That "investigation," instead of giving a different result, HAS ONLY CONFIRMED

This prediction (see note, page 16,) was given in more ample details to my personal friends than to the above scientific body.

IT! And 2dly. In relation to "forming the theory first, and hunting up the facts afterwards to sustain it," it is due to the late Sanitary Commissions to say, that at one of its sittings near the termination of its labors, the question was asked me, if I could state what those metereological elements were to which I had attributed so much efficacy. I replied that I thought I could. It was then only that I re-examined all the records of epidemics in which the meteorological elements had been recorded,—the results are in the table at page XII Introduction. The *facts* then *preceded* the theory, as they always should; the deductions are legitimate and fair,—post hoc et propter hoc form the "formidable catalogue," and the generalization from them has thus far withstood the test of scrutiny and time.

It seems to me that until actual experiments are undertaken and carried through, with a view of ascertaining the precise meteorological elements existing during yellow fever, which my own so carefully made for a long series of years,—of a high dew-point, and high solar radiation, &c., I, with all due deference, think, it would be modest, if not courteous, for those *who have never made an experiment on the subject*, to defer dogmatic remarks and unwarranted assertions, that are as unbecoming as they are undignified. These reliances upon recollection for meteorological conditions may be simply termed record *vs.* recollection—exactness *vs.* looseness—fact in the place of fancy, and clearly demonstrate that they are entitled to no reliance whatever in a scientific discussion.

Nowt he records will bear me out in the averment, so far as they have been made, that no epidemic of yellow fever has ever occurred in this country, and I much doubt, if in any other, without a high dew-point,—that is, without a high degree of moisture in the atmosphere in such district; this depends upon the temperature, the quality of the soil, and its mode of precipitation. The dew-point is a measure of this condition, and a reference is made to it throughout the text, as the standard and index of that condition. The bold, if not reckless averment, that the "season is dry and parched," which is a mere relative condition, without this proof of it, must be considered now only a proof of ignorance. And here I may state that there is a wide distinction between "*drought*" and "*dryness*;" they are, properly, not correlative terms; there may be "drought" without "dryness," and dryness without drought. Drought strictly means a long absence of rain without reference to the hygrometrical condition.

These explanations are obviously called for to correct or rebuke the loose manner in which the terms drought and dryness are often used in speaking of the character of seasons. If they were used in their strict signification and the indications of the hygrometer, the true test of the condition, professional men would no longer misunderstand one another—they would then reason from the same premises, and the true principles of etiology would be appreciated. Let us illustrate these principles by recorded facts.

Dry periods and wet periods, I repeat, are altogether relative—they are dependent upon conditions just pointed out—they cannot be altogether dependent upon the amount of rains falling. Rapid, although heavy rains, seem, and actually do deplete the air, and leave it, as ascertained by the hygrometer, drier than before; rains that fall at short intervals, with a high temperature and hot sun intervening, make it very *humid*. Again, a clayey soil will retain it on the surface, and a sandy soil absorb it. A moist air is known, even when supposed to be dry from rain not falling, by the occurrence of mould upon leather, books, &c.—from its influence on various saline substances—from what is denominated a "funky" smell—from stagnant air, &c., and these I have never seen absent during yellow fever.

It is an observation of many years anterior to the special exactitude by the hygrometer, that fogs hanging over undulating and irregularly elevated sections of country, influence their salubrity. Prof. Wistar remarked it more than half a century ago, in the vicinity of Philadelphia, and in the malignant fever in Wilmington in 1809, it was specially noted that wherever the fogs were heavy the disease was most rife; indeed, this is a well-known fact of almost universal observance. Fogs denote saturated, or nearly saturated atmospheres. Rains rarely ever accompany fogs—the line of malaria, as it is called, above the Pontine marshes, is precisely marked by these very fogs—it forms the limit of the "poison," if you will—it is, in plainer language, the necessary constituent of their existence.

The proofs that the amount of moisture in the atmosphere is not sufficiently indicated by the amount of precipitation, has been most thoroughly shown by Prof. S. B. Hunt, of the University of Buffalo,* "during the months of June, July and August, 1855," says he "in

* Vide Buffalo Med. Jour. for Nov. 1855, p. 350.

the city of Buffalo there have fallen near 14 inches of rain, while the atmosphere has been far drier and the dew-point lower, than during the drought of the summer of 1854, when only about $4\frac{1}{2}$ inches fell during the corresponding time." This I have often noticed.

The assertion so often made, that the atmosphere must be dry because large amounts of rain have not fallen, is met by the experimenter by actually showing with the hygrometer what that state truly is—and this is often conspicuous during long droughts, and is farther shown by the heavy dews that now fall, and hardly a surer sign of rain can be given than these being withheld. A few illustrations extracted from my meteorological journal will make this very plain. Thus, if we compare the winter of 1852, during which there fell 7.470 inches rain, with that of 1850, when it amounted to 14.556, we find the relative humidity in the former to be .816, while in the latter it was only .776. Again, the summer of 1852, with a precipitation of 7.685 inches, has a relative humidity of .861, while that of 1849, with a precipitation of 24.464 inches, has but .877. The autumn of 1850, with a precipitation of 3.441, has a relative humidity of .759 and 7.088 grains of moisture to each cubic foot—while the autumn of 1853, with a precipitation of 17.257 inches, has a relative humidity of .843, and but 6.893 grains of moisture to each cubic foot.

Our driest year—1852—during which there fell only 39.968 inches of rain, when compared with one of our wettest—1853—during which there fell 62.641, is as follows:

During 1852,	Average annual humidity, .834.	No. grs. in each cubic foot,	7.055.	Average dryness,	6 09.
" 53,	" " " .839.		6.714.		5.70.

Again. No interval of drought in a period of 20 years, during which I have examined my records, *exceeds* 26 *days*—notwithstanding the often-repeated statement, "of months in which not a drop of rain has fallen," &c., and this has been *but three times;* and of periods of 20 and over (excluding the above), there have been but 8. During these long droughts, the dew-point has sometimes been higher (indicating more moisture to be in the air) than at neighboring periods with the usual precipitation. For instance, in April, 1841, during a drought of twenty-three days' continuance, the average dew-point at midday was 63.63, while during the seven days in which there were several rains, amounting to the large quantity of 7,250 inches, the dew-point actually fell to 61.60. I have records of several instances during which the dew-point was higher during droughts than after rains, and there is often more moisture in the air than during *heavy* rains, and these illustrations might be greatly multiplied.

Hence, then, the foundation as well as the proof of the remark with which I set out, that wet and dry seasons are relative, and the humidity is not altogether dependant upon the amount of precipitation, and in estimating the more or less moisture of a season rains alone are a most fallacious index.

Nevertheless, by reference to the actual records kept here for more than thirty years, the *uniform facts* are, that a large amount of rain always falls during our epidemics, and in that month in which it reaches its culminating point, there is usually the greatest precipitation, and if there is any single exception to this, it is that it occurred in the month *just passed*, but *never* in the *succeeding month.*

It has never been stated by me that the dew-point was injurious *in proportion to its elevation* in yellow fever as I did of "sun-stroke," for this is the very weather required for that, with a high temperature. But that a high dew-point was *essential for its origination and continuance as an epidemic*, and I have yet to learn that yellow fever *ever occurs as such without it.* But then, as it is not dependant *upon it alone*, the several statements of a high dew-point without the disease appearing are not at all applicable, this being but *one* of the conditions, *sine qua non*, to its appearance, and it *never* depends upon one alone. But wherever proper attention has been paid to the subject, a large amount of moisture has *ever* been shown to be present, and the late disastrous epidemic at Norfolk has as well illustrated it, as at Savannah, Charleston, Augusta, and at this place.

If humidity is not necessary for yellow fever, and even a high temperature, there is no reason why it should not prevail in various northern and elevated parts of the United States where other conditions exist. If great humidity was not essential for sun-stroke, we should have it of frequent occurrence in the mountains where I have seen the thermometer rise in the sun to 145°, while in the shade it was not much over 70°, and the dew-point a little above 60°.

Temperature influences much the effect of humidity on the body, the exact amount requisite for health has not been shown, I shall presently indicate what is enjoyed here during our periods of least mortality. I have endeavored to procure it of most other cities, not with sufficient success, equal to its importance, for certainly no other meteorological condition has been pointed out which so much inflences health. Baron Humboldt remarked of Cumana "that it was the hottest, driest, and healthiest city in tropical America." If we proceed to a different temperature and climate, and witness the remarkable health enjoyed in England and Holland, enveloped in their almost perpetual fogs, and then notice the great difference in the health of the same people emigrating from that temperature which is low to this, which is very high, the mortality resulting from it is shown to be greater than that attendant on any other.*

Probably no climate in America has been so little understood as that of New Orleans. Although this is not the place for its defence, it comes within the range of my observations to correct some errors. It is cooler than Galveston in summer and warmer in winter, and has less amount of precipitation than any recorded position south of Charleston. The mean annual temperature is 67°.84; the dew-point varies from 80°.9 to 7°.4; the mean annual dew-point is 61.96; the mean compliment of the dew-point or drying power, for a series of years is 6.19; the extremes being from saturation to 41.9, and the mean amount of moisture in each cubic foot is 6.848. This remarkable peculiarity of climatic condition is mainly due to the defensive position of Lake Pontchartrain to the north of it, moderating the winter's cold and snmmer's heat, and the vicinity of the gulph and large arms of the sea, all tending to satisfy the mind that with proper clearing, draining, and rigidly enforcing sanitary measures, it is susceptible of vast advancement in its sanitary condition.

On a careful analysis of the mortuary and meteorological records here for twenty or thirty years back, there is a conjuncture of conditions when nearly as great salubrity is enjoyed as elsewhere; that occurs with a temperature between 60° and 65°, and dew-point from 50° to 55°, with humidity about .750, and having about five grains of moisture to each cubic foot of atmospheric air. This is sufficient to prevent that combination spoken of in the text, and constituting a branch of the "shears," and it is remarkable how near this is to the mean of this climate, both in temperature and hygrometrical condition just noted.

* *Vide* table at page 36 in the body of the report.

It is the result of individual experience all over the world, that our main dependence for health and enjoyment is upon atmospherial conditions, and there is little doubt, but there is some definite amount of thermometriical, hydromatrical, and other atmospherical ingredients, that is required for the highest conditions of these everywhere, and for every person, for each climate—experimental observation should determine what these are. Different degrees and combinations, we now know, from their disastrous effects, how injurious they are; they have taught us, for instance, that a combination of great moisture with a high temperature, with filth, is much more fatal in its influence on the body than where the temperature is low,—that maxima of moisture and temperature produce the most rapidly fatal of all diseases—"sun stroke,"—but that in a medium between these extremes, the highest measure of health is enjoyed. I have said above what it has been found to be here. Probably the temperature, most agreeable and conducive to health and enjoyment in temperate climates, is from 60° to 67° with a dew-point from 58° to 62°, and somewhat lower as we proceed north. During the worst period (average of about a week) of the epidemic yellow fever of 1853, the temperature *averaged* °77 40, and the dew-point °74·70, and radiant temp. °131; while the extreme of the first was °91, of the 2nd °79·4, and of the sun temperature °148. In England, one of the healthiest climates in the world, the average annual temperature is about °51, and dew-point about °43. Now I lay it down as a principle, after a very laborious examination of many other climates than this—from which, I think, there will not be found a very wide departure—that unless some unusual cause for mortality shall exist, that the *mean annual temperature and humidity* of an average healthy climate, is *nearest approached* in *those* months *which habitually have the least mortality*, and this is probably the law.

It is shown in the text that all forms of fever are dependant upon atmospherical conditions mainly, and it is, by an attentive examination of their laws, that these influences can be thoroughly understood.

An indisputable proof of climatic influences upon yellow fever, is furnished in the remarkable fact, mentioned in the report, as noted by those philosophical observers at Rio and other places, and doubtless would have been exhibited everywhere if proper observations had been made; that, wherever it has appeared for the *first time*, it has *ever been preceded by changes in that climate.* Similar changes have probably occurred on its departure. This shows how inapplicable the terms "indigenous" and "exotic" are, when applied, as they have been to yellow fever and other febrile diseases. They are all owing, mainly to climatic influences, and arise from combinations of these and other conditions wherever they exist in the proper proportions for their developement, as will be shown presently, and require no other "seed" —"germ," or "sporules" to "hold over," or for transplantation.

Yellow fever, as it has sometimes appeared in the rural districts in the south-western parts of the United States, would not seem to be governed by those strict laws which have been found so invariably to characterize it in the city. This, I suspect, is apparent only. In the remarks made upon this subject, I have most emphatically limited myself to that aggravated condition constituting its *epidemic grade* only, and in all the examinations into these occurrences which I have been able to give, I have not come across a single instance to shake my faith. Sporadic, endemic, and incidental cases have occurred, both here and elsewhere, which have depended upon local conditions and great individual susceptibilities, that are beyond the influence of any general law or cause, and should not detract from their value, or the influence may have been already made by exposure, and afterwards developed by circumstances. Thus cases have occurred here in every month in the year, without partaking at all of an epidemic character,—it is the same in the rural districts,—frost upon frost has occurred, and still some cases continue; but it is believed no *epidemic*,—there is no proof of that wide-pervading influence which characterizes this. Precisely the same remarks are applicable to cholera, where this is said to occur in a temperature near or even below zero. It only means that this is the temperature *out of doors*—forgetting that the temperature within is almost or quite tropical! with all the filth and want of ventilation proverbial in Russian dwellings, where these have occurred.

In stating the meteorological elements deemed necessary to provoke the condition essential to the development of yellow fever, it is proper to say, that it is sometimes as great, or greater, than is met with at the period of *maximum intensity;* that a particular day cannot be stated when it actually first commences, as such, and the same as to its decline, and hence it is my custom in estimating these periods, to take an average of from five to seven days, but the maximum does not often require so large an average—often the very day can be fixed on, as in 1853, '4, '5, from which the decline progresses, more or less regularly, to its termination, dependent upon the condition of the weather. This change is nearly always accompanied by a very sensible decline in the dew-point, in the two latter years particularly. This culminating point of the epidemic never occurs at the same period during any two successive epidemics, although this takes place more frequently in September than in any other month. In 1847, '53, and '55, it occurred during the latter part of August. But I repeat, that no great change has ever been produced in this disease, without some very sensible alteration in some of the meteorological elements,—usually the dew-point; in 1853 it was more especially in the solar radiation.

It is further proper to explain in relation to the pressure of the atmosphere on yellow fever, that it does not appear as obvious, from the table at page 13 "Introduction," as the real facts would justify. Previous to 1848 the barometer I used was not standard, it was the best I could procure here; on setting it aside for the standard instrument in use since, I omitted, in the hurry of preparing my calculations, to add nearly 2-10ths to its readings, this being the difference between the former and the latter instrument, and would make the record to correspond nearer to the statement in the text—viz., that these epidemics occur during period of high atmospheric pressure.

In the application of these important meteorological principles we have the true key to the explanation of phenomena, which heretofore have been the constant theme for controversy among professional men;—why, for instance, with the exposure of 50,000 victims annually, formerly, in the high and dry city of Mexico in their inhuman sacrifices, and of 40,000 offered up at the dedication of the great temple, whose altars and vicinity were ever reeking with human gore, pestilence did not immolate the population, as it would in this humid country;—why occasionally, only, a mortal fever follows exposure of the dead on fields of carnage, and *sometimes* depopulates whole villages;—why a dead whale cast upon the coast of Holland has, by its putrefaction, created a pestilential fever; and why it then produces no effect;—why Captain Cook with his system of dry rubbing the decks of his vessel, instead of deluging them with water, (as is the more common custom,) circumnavigated the globe without losing but one man; why it is so fatal watering a vessel on a pestilential coast—those alone suffering (and uniformly) who remain during a night on shore.* Why fires in our rooms in the wet and sickly autumns of the lower countries tends to retain our health, and thus the salubrity of our negroes is preserved under their habitual system of kindling great fires in their cabins;—why woollen clothes, from their *attraction* for moisture, are so retentive of fomites and offensive smells;—why, in fine, is it *that filth and offal of all kinds, nay every species of decomposition, appears at times entirely innocuous*, but at others shows its deadly fatality. We can thus explain how it is that digging and disturbing the soil is not so injurious in a *dry atmosphere* as in *humid hot weather*. Medical history teems with similar examples which it is useless to multiply, for it is clear that this is the only reasonable interpretation, as it applies with admirable fidelity to all these numerous variations and reconciles so many apparent contradictions. And here we could draw

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* I have received, since the above was written, the following interesting letter from a distinguished and long experienced Captain in our Navy, as eminent for the strictness of his discipline as far as the salubrity of his men, and respected and beloved by all.

FREDERICKSBURG, VA., November 8th, 1856.

MY DEAR SIR:—As the late cruise of the Frigate Constitution on the coast of Africa, has attracted some attention on account of the unprecedented good health of her crew, I attribute that happy result principally to the following circumstances:—"The crew having been clad in flannel;" "*the ship kept as dry as possible;*" "letting nowater from the sea into the hold;" "the galley (the cooking apparatus,) being on the birth or lower deck;" "and the most rigid enforcement of the Sanitary Regulations of the Navy Department." The decks of the ship were not permitted to be washed except in good weather, and then only when necessity required it, so as to keep her clean—after the lower deck was done (which was frequently with hot water)—the cinders from the coal at the galley were put in hanging stoves about different parts of the deck. The old practice of letting water in the hold was entirely abandoned, she was pumped out twice every day, so as to keep her dry below, and from that usage we never had any smell. During the cruise of the Frigate Macedonian in the West Indies in 1822, when I was attached to her, the contrary was the *usage*, even in the harbor of Havana, the fatal consequences are well known, the yellow fever broke out, and in three months we lost 105 of our crew with that disease. I met, some years after that in the Pacific, Captain Coglan, of the British Navy, who informed me, that during the French War, he was in a frigate on the West India Station, that they kept every thing dry, and her crew remained healthy; the rest of the fleet had the yellow fever, caused by their continued wetting. The galley being below added very much to the good health of the ship, not only keeping her dry, but purifying the atmosphere, the only objection urged was, that it was more difficult to keep it clean on account of the darkness of the lower deck. The Sanitary rules of the Navy Department which were in force, did not permit any person to be on shore after sunset or before sunrise. I have briefly submitted to you these remarks relative to the cruise, if they can be of *any* service in *any* way to you, I shall be much pleased.

I remain, with great regard and friendship,

Yours, &c.,

DR. EDWARD H. BARTON. JNO. RUDD.

a most useful and profitable lesson in our own city, not only for the purposes of health on which I have enlarged so much in the report, but for domestic and commercial purposes. Excess of humidity is the greatest embarrassment our situation exposes us to, these have been mostly mentioned in the text, with the mode of remedying them.* The finest goods become spoiled by passing a summer in our stores, built with an utter disregard of all our climatic liabilities; flour sometimes sours in a few hours, while with a careful watching of the hygrometric condition such a loss (by purchase at least) would never be experienced. By watching the meteorological conditions, as occurring in this city, a very near approximation can be made, at least sufficient for all practical purposes, to that of its conditions throughout (probably) the entire delta of the Mississippi; hence the condition of the crops, the rise of the rivers, and the early or tardy reception of that crop in market, can almost always be foretold with very tolerable precision. By neglect we thus disregard the teachings of science and the lessons of experience, sacrifice health, and with it the reputation of our city, and the wealth and enjoyments of life.

Here there are precisely those "certain meteorological conditions" which the philosophical sagacity of the late Professor Harrison, of our city, deemed alone as needed to explain the phenomena required for the development of epidemic yellow fever, to give activity, force and life to the second or terrene condition. We several times conversed upon the subject, but the experiments were not sufficiently numerous at that time (1843–4) to authorize conclusions; and it was not until the disastrous year 1853, that they became extensive and unequivocal enough to justify fully the conclusions now derived from them. The truth at last burst upon us, and the aggregation of antecedent and subsequent experiments now fully authorizes us, we hope to say, there is no longer any room left for reasonable doubt.

I trust now, after this minute if not tedious recital of facts, that the position in the report of the necessity of a high dew-point for the existence of yellow fever has been fully sustained. It might have been corroborated by illustrative facts from other regions, but they were deemed superfluous. Detail, exactitude is, at once, the creation and creator of modern science, indeed there is no science without it;

* And for farther illustrated see my report on the mortality and meteorology of New Orleans for 1855.

in the language of Lord Bacon—"It is leading mankind to particulars." Science is created by laws, and these are formed by the generalization of a "multitude of facts repeatedly and accurately observed and carefully noted." The same great authority has said that "he that cannot contract the sight of his mind as well as disperse and dilate it, wanteth a great faculty." Detail and generalization in all things are equally subservient to master minds, and their intimate personal history eminently shows it.

It affords me much satisfaction to state, that since the last edition of this work was issued, much farther testimony has reached me, that the meteorological and terrene causes of yellow fever, laid down in the text, have been most fully borne out in a variety of places, corroborating the facts and principles advocated. As full details of these as might be desirable, it has been found impossible to procure. So few medical men keep minute meteorological journals, or pay but a passing attention to the weather, or note improvements, changes, or passing events, that special exactitude is rarely to be found. The following, however, may be relied on as far as they go:

The recent (1855) fever at *Memphis*, Tenn., if not mainly owing to the cutting down and levelling the streets in the spring and summer season, has certainly been greatly aggravated thereby.*

At *Charleston*, in 1854, there was a filling up of lots in the neighborhood of the Marine Hospital, and disturbance of the streets for the purpose of laying down the gas-pipes, and repairs. But the most remarkable similarity will be found in the meteorological elements, which prevailed during the successive periods of the epidemic, and which will be found to correspond in all essential particulars (so far as they go) with those prevailing in New Orleans and Savannah, as exhibited at page XIII of the "Introduction," and page XIV of these "Prefatory Remarks," although the hygrometer was recorded only once daily (at sun-rise). These are comprehended in the following table:

* Professor Merrill.

Meteorological elements prevalent during the existence of the Epidemic Yellow Fevers in Charleston, in 1854.

Periods of	Date of these.	Av. Thermometor at	Av. Temper. in Sun.	Av. Dew-point temp. at sunrise at	Av. Barometor at	Predom'nt Winds at	Av. Humidity at	Av. Drying Power at
1. Commencement,	between Aug. 30th & Sep. 3d	80.86	none	75.40	30.259	S. E	.845	5.46
2. Maximum intensity,	Sept. 18th and 25th.	73.33	made.	70.16	30 279	N. E.	.902	8.17
3. Decline,	Oct. 26th and 30th.	67.22		63 33	30.176	N. E.	.882	3.89

After much trouble, I have to express my regret that I have found it finally impossible to procure the meteorological or mortuary data prevalent at *Augusta* during the epidemic yellow fever of 1854.

Norfolk and *Portsmouth*, although surrounded (as it were) by government establishments—proper meteorological records, it is believed, were not kept during the existence of the epidemic. Nevertheless, I have procured from eye-witnesses information which leaves not a doubt that the same kind of weather which characterized yellow fever seasons elsewhere, was eminently exhibited here,—viz.: that the temperature in the sun was extraordinarily high and oppressive, and in the shade varied from 85 to 95 for more than two months ; that the chilly north-east wind greatly augmented the cases ; that the air was close, stagnant and humid, so much so as to render it difficult at times to light a lucifer match ; that a thick green mould gathered almost everywhere, even on counters and shelving, sometimes to the extent of half an inch in thickness ; that the rains were frequent in July and August, but instead of cooling the atmosphere, were invariably followed by more intense heat ; and the disease was finally put an end to by a heavy rain and north-west wind, lowering the temperature, early in October. The epidemic influence was farther shewn on fruit, which prematurely rotted in the trees, many of the leaves of the shade trees changed color and withered at an early period ; not a bird was seen within the city limits, and many dogs and cats fell victims to hemorrhages from the nose and mouth. The noxious effluvia of the city was so concentrated and offensive as to be perceived far beyond its neighborhood.

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* For the materials to make this Table, I have to express my obligations to that lover and promoter of science, the Hon. M. King, of Charleston.

With regard to the coefficient or terrene causes of this fever, investigation has not left a doubt on my mind. The intelligent letter of the United States Consul at Vera Cruz (J. S. Pickett, Esq.,) whose experience in yellow fever should attest his qualifications as a most competent witness, and who was incidentally a passenger in the much-abused "Ben. Franklin," to whose arrival from Porto Rico the fever has been attributed,—I give below.* On a careful perusal of that letter, every candid and unprejudiced mind must fully exempt that vessel from having had any agency in the origination of the fever, and consequently from its being imported from abroad.

It has been clearly demonstrated by those who have thoroughly investigated this subject on the spot, that so far from this ship having originated this fever, that cases occurred some days before her arrival at Gosport; that of all the men who worked upon her, and they were numerous, at this filthy spot only two were attacked with the fever, and they were exposed to other much greater liabilities than this vessel af-

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VERA CRUZ, September 21st, 1855.

To the Editor of the Norfolk Herald:—From the reiterrated statements in the public press of the United States, the impression has been made that the awfnl mortality at Norfolk and Portsmouth is traceble to the steamship Ben Franklin, which arrived at the latter port from St. Thomas early in Jnne.

As snch an impression is calculated to mislead and baffle scientific research as to the true orgin of the plagne now desolating those cities, suffer me to disabuse the public mind by stating a few facts

The Ben Franklin left St. Thomas for New York on the 27th of May, with thirty-three passengers—men, women and children—most of them unacclimated persons. The second or third day out several of the crew and firemen were on the sick list, but whether from rum, fatigue, or malingering, (commonly called "sogering,") I shall not pretend to say. Certain it is, there were no cases of yellow fever among them, and the writer has, he thinks, seen enough of that disease to recognise it when existing.

On the fifth or sixth day, one of the men (who had been up and abont the day before) died suddenly, and withont having exhibited the least symptom of yellow fever. I attribnted his death to some organic functional derangement, most probably of the bowels, for neither purgatives nor *enemata* had any effect npon him.

The tenth day out we put into Hampton Roads, in distress, having for the preceeding two or three days made scarcely any progress, the ship leaking badly, and the engine almost entirely "broken down." At the very time of getting in, the only other death occurred—that of one of the firemen, who had been at his dnty the day before. Could his have been a case of yellow fever? I think not.

We had not anchored when the boat from Norfolk to Baltimore came in hail, and with a single exception every passenger was transferred, bag and baggage, on board of her, and fonnd themselves safe and sound in Baltimore next morning. I have either seen or heard from *every one of those passengers, and that one left on board since then, and not one of them has had the slightest symptoms of yellow fever.*

Now, when we bear in mind that the cabin of the Ben Franklin is below deck, and that it had constantly open communication with the hold, and that the delicate sea-sick women and forded; that the first case occurred at least one and a half miles from her, at a house on Scott's Creek, north-west of Portsmouth, in a patient for a long time bed-ridden, and having no communication with Gosport,—and soon after at Barry's row, to the north-east, and then at Gosport; these three positions, forming the angles of an equilateral triangle, the sides being one and a half miles in length, and all independent of each other.

But the *cause* of that terrible malady is not left in a moment's doubt,—with the presence of the meteorological ingredients mentioned,—the aggregation of filth and disturbance of soil now to be referred to, were amply sufficient to account for any amount of pestilence which prevailed, and although these were not exclusively confined to this year, yet there is no evidence that the meteoric elements were present to the same extent before, although there were cases of yellow fever. We are informed that a number of wharves were most culpably, (although economically), made years ago "*of green timber, logs and brush, which had now begun to decay, and were filled in with city filth, refuse, and low marshy debris, drawn up from the half-stagnant streams and pools in the neighborhood of both places, and with the shavings and refuse of the yard. That the hot sun and tides had alternate*

children were shut up there most of the time, and that the male passengers were two days and nights constantly at the pumps—being, withal of the class *fruges consumere nati*, and not "drawers of water," except for the nonce—is it not passing strange that none of us suffered from the pestilence with which, according to the newspapers, the vessel was reeking?

Moreover, the Ben Franklin had positively no cargo, *except coal and cannon*—none of which did she discharge. The "Breaking bulk," so much harped upon, could relate only to a few heavy articles of passengers' luggage, left on board, but which were stowed under an open hatchway.

My impression is, Mr. Editor, that the Ben Franklin is more sinned against than sinning. I believe she caught the infection at Gosport, instead of taking it there. Several men-of-war and other vessels had arrived in those waters a short time previously, all teeming with yellow fever. Why, then, make this most unfortunate of vessels, (you have heard and will hear more of her history,) the scape goat for the sins of others?

We have been reproached for leaving the vessel so unceremoniously the moment we got abreast of Old Point Comfort, and without waiting for the visits of medical or custom-house officers. To that I would say, even to rats is accorded the innocent privilege of quitting a sinking ship when they can. We had nothing to smuggle, and knew there was no yellow fever on board. This was the second time I had left a vessel under similar circumstances, and with equally little ceremony at Hampton Roads, and without ever hearing of quarantine or custom-house.

I desire this to be published, to vindicate myself, the officers of the ship and fellow-passengers, from the implied charge of a culpable recklessness, which, if merited, could not but—in view of its awful consequences—disturb the conscience of a fiend. I am anxious, too, that the medical faculty, in their noble labors and investigations as to the cause of the direful calamity, may have facts and data at command. J. T. PICKETT.

access to these putrifiable and offensive materials, and that this debris was farther used to fill up low places in the vicinity and suburbs; that so offensive were the wharves and yards in these infected localities where the fever first broke out and spread, and also near where the Ben. Franklin *was moored, that a piece of meat exposed a short time within a few feet of the surface of the earth, became speedily putrid.*" Here, then, there is nothing wanting to complete the ingredients for the most fatal pestilence, and in conformity with those laws, with which I doubt if *there has ever yet been an exception, it came to fulfil the destiny man's folly and ignorance had prepared for it!*

Farther proofs of the correctness of our position, are, I am sure, not needed; yet the appositeness of the following will not permit me to forego them.

That there was great moisture in the atmosphere during the yellow fever of 1793 in Philadelphia, notwithstanding the great drought which prevailed, is shown by the universal complaint of the great oppressiveness of the heat. Laborers were often compelled to cease work when the mercury stood no higher than °84. It was observed, too, that the sweat on the surface of the body dried but slowly. It rained heavily on the 25th of August, and then not until the 15th of October. The stagnant air teemed with deadly vapors, scarcely a breeze ruffled the unbroken calm. "The light of the sun shone steadily and fiercely from the blue arch—hot and stifling like the dome of a furnace."

In New York, in 1795, the yellow fever was confined to the neighborhood of some unfinished docks, which were full of all manner of animal and vegetable corruption; across one of these, an obstruction had been erected, in consequence of which a pool of stagnant water was enclosed and suffered to putrify under a burning sun. There was much *made ground* in the same region derived from the offals from the streets and cellars of the city."

In 1798, the yellow fever prevailed in Boston, Wilmington, New York, Philadelphia, and the weather in each was characterised as "remarkably hot and moist," and with the presence of similar conditions as those expressed above.

It prevailed in Baltimore, in 1800, and was said to have been much aggravated by the "exposure of fresh earth to the action of the sun in the filling up of docks," &c.

Thus then, wherever records have been made, the meteorological conditions, I have deemed essential for this class of fevers, viz: much heat, fiery sun, humid atmosphere, much stagnant air, and when winds, usually from the East or N. East, together with great filth, crowded population, newly *made ground*, and disturbance of soil ever characterised the conditions—only varying according to circumstances and liabilities.

After all, it must, nevertheless, be acknowledged, notwithstanding all the sufferings temporally experienced, that epidemics are not entirely without their advantages; they, at once, exhibit the value and neglect by the authorities of sanitary ordinances, and point out, with an unerring eye, to those rotten ulcerous spots—those pest-houses in cities which are ever their seat, of almost whatever kind of disease prevailing, whenever a city is so invaded. Filth is man's great enemy—one of the chief objects of government, nay, one of the special ends of municipal institutions, where disease is so much more rife than in the rural districts, is the protection of the citizens by police regulations, and I cannot but think it is ever the *fault of municipal authorities, if a city is invaded by epidemic disease, and especially of the zymotic class.*

The value of sanitary ordinances has been widely experienced in almost every part of America, (may be excepting New Orleans, where they have only been applied to the most limited extent.) Baltimore, a few years ago, was unquestionably saved from cholera, then prevailing in neighboring cities and sections, when even the usual prodrome of the disease had made its advent, by extraordinary attention to her sanitary condition. In Boston it was once almost entirely prevented, and on another occasion was modified and ameliorated, and when it did occur, it was mostly in the neighborhood of her weak parts, the filthy and neglected spots, which were thus pointed out by it.

We shall see this summer the effect of the alarm and apprehension of a visit of yellow fever, in producing increased attention to sanitary police. Indeed I deem these occasional alarms greatly salutary, as conducive to the preservation of order and cleanliness, and therefore health. In New Orleans, the liberality and devotion to the *sick* is without a parallel *when the epidemic arives*, but very little is done to *prevent* its occurrence. In the paraphrase of a celebrated motto:—"millions may be given for *cure*, but not a cent for *prevention.*"

II. The second difficulty met with is in relation to some "*specific poison*," in order to develop yellow fever, "whose nature is said to be extremely indefinite, and whose origin is very obscure." It is admitted that of this germ or poison we absolutely know nothing—merely inferring its existence from its effects—or supposed effects.

No man doubts but that a specific effect may occur, without there being required any *one specific thing* to produce it always, and all medical experience is replete with instances to prove it. I need only mention one or two, thus: intermittent and bilious fevers—so much like yellow fever—may be produced by an almost infinite number of circumstances—a debauch—"taking cold"—a fall—an accident—a moral emotion, &c., &c.: the same with regard to the greater part of the extensive class of zymotic, and some other classes of disease—excepting, probably, the unequivocally contagious maladies. Why, then, should we look to some "specific poison," and to that alone, to produce yellow fever, and by men too who do not believe in its contagious properties? Now, all these diseases are recognized as the same, from whichever of the causes they originate. In the text as well as in the "supplement," it is shown that all these fevers may originate from the same cause, differing in degree—that is, combinations of the same elementary principles in different proportions—and in each be followed by a specific effect or result, differing from the other. The grounds of this opinion are therein detailed, and need not be repeated.

To this class of causes belong that supposed to be derived from animalculæ. The allegation of a specific, tangible material cause of a fever, requires something more than mere assertion, and this it has never had. At all times, and especially during the existence of malignant epidemics, the air is filled with microscopic animalculæ. The material world is everywhere and at all times teeming with life—each successive chain of being feeds upon his predecessor—some seek their sustenance upon man—and when their influence amounts to disease, it is, as far as *we know*, of a traumatic nature. The mystery of idiopathic fevers has never been even plausibly ascribed to them. Poisons, to affect the system, act in two ways—on the sentient extremities of the nerves, and by absorption. For the first there is required a special poisonous quality—this needs proof here, which is impossible—it is not even alleged. For the second, *previous solution* is indispensable, and this would change their qualities. The whole view of it is preposterous, and is contrary to the entire analogy of nature, and none but those entertaining a gross misconception of the character of insect transformations could, for a moment, entertain such an idea.

It requires a large amount of credulity to believe that the combination alleged to produce this disease, could produce the spontaneous birth of animalculæ possessed of such poisonous properties. In the elements to produce the "poison" (if you will), the true causa causans, there is no evidence whatever to show that these constituents are of an animal or cryptogamic nature, but every one to convince us that they are of no animated quality whatever, but producing their effect through an æriform nature, influencing the organism directly through the nervous system, and this is clearly the first and most affected in yellow fever.

Leibig has satisfactorily shown the impossibility of explaining, on chemical principles, the existence of even the lowest connecting parts of an organism of a cell or a muscular fibre; and Rokitansky has demonstrated the utter futility of the microscope as an instrument of diagnosis, between malignant and harmless growths and tumors. Is it saying too much, then, that he must be truly transcendental, who can see animalculæ the cause of disease so obscure as the idiopathic fevers.

It is alleged, besides the combination alluded to, or the agencies meant, there is a "secret agency"—a "peculiar something," productive of, or rather constituting the epidemic principle, which is the cause of its power and extension. There is no proof of this opinion, it is devoid of plausibility—it is at once an acknowledgment of our ignorance, and a poor excuse for the indolence which makes no exertion to ascertain it. These secret agencies and occult mysteries are the bane of the science, and are only a remnant of that feeling which gave rise to astrology, which clothes with suppositious virtues empirical medicine, and bolsters up all the isms and pathies of the day They must give way to experimental medicine and philosophical induction. If the profession would put their shoulders seriously to the wheel, instead of speculating in their closets, these ridiculous mysteries would soon give way to facts; endless disputes and false facts would no longer be a by-word and reproach, and the world would cease to laugh at our interminable differences, and the "uncertainty of physic."

No apology is needed in giving my own views of what I believe to be the true theory of the *causa causans* of yellow fever more *in extenso* than in the report itself, originally intended mostly for laymen, and I avail myself of the opportunity presented (by this edition) of giving more fully the grounds for the "faith that is within me."

How far, then, have we progressed in a strictly scientific understanding of the true etiology of yellow fever? What principles are fixed and stable upon the basis of scientific laws, during more than two centuries of its ravages? What a reflexion upon the profession, and why is it? We have had a vast amount of speculation as to its cause, but in America, at least, the experiments have been meagre and the facts few. In Norfolk even as recent as 1855, surrounded by government establishments, but the scantiest record of the weather was kept*—none worth the name, and at Augusta, for 1854, none could be procured. Too many are content with the beaten track—too many confine themselves to its pathology and treatment—too many are satisfied with limited views, confining their observations to a narrow circle, content with one series of circumstances not reaching a principle. I am too much afraid routine has been substituted for experiment, and that hypothetical assumption and defective observation have cast a cloud over the profession, and poisoned the great stream of truth even to its fountain head. Such is unfortunately too much the experience in all human investigations, dependant upon imperfect observation, until science, with her magic wand, is made to shed her vivifying rays upon them, it then progresses under the guidance of its laws, and the results are—final truth. I have by no means the vanity to suppose that I shall be able to dispel this cloud, but, at least, I shall give facts that do not admit of a doubt, and if I must necessarily speculate beyond merely generalising, it will be, I trust, upon their stable basis.

Let us then have something fixed, something established, and the sooner we begin the better. The true understanding of the etiology of yellow fever, which has become now the great bane of our country,

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* To the first named place I sent the necessary instruments, with blanks and instructions but no results were procured.

is demanded of the profession, and implicates its deepest and most serious honor. Encouragement should be extended, instead of casting ridicule on every experiment, tending, however remotely, to develope the conditions or the laws influencing it.

There *must be a cause of yellow fever*, there *must be principles and laws governing it;* these are only to be obtained by observations and experiments assiduously made for a series of years and carefully recorded. Do we truly know the real *bona fide* cause of any one specific disease? Has ever the vaccine or small-pox virus been analysed? Do we know the proportions of their elementary constituents? Yet they must be formed of a *combination of elements in definite proportions, whose union forms them alone*, and these are the most special of all tangible causes; they are not only tangible but visible, the others are not, and yet no one has ever recomposed them from their elementary constituents. Except, then, the unequivocally contagious maladies thus formed, I know of no diseases that are more comparatively simple in their causation, except those requiring no coefficient. The folly then of ascribing yellow fever to any such cause as has been ascribed to these is obvious enough, the attempt so to limit it has puzzled physicians for ages. In all the discussions upon this subject a certain high range of atmospheric temperature was heretofore admitted as essential, that is now denied.* There is, however, a general admission by the profession everywhere of the necessity of a high temperature, moisture, and organic decomposition, and by many a special poison. My own impression is, that to the three first high solar radiation is to be superadded, that these all combined in some *definite proportions* constitute the agent (or "poison," if you will,) that developes that type of fever, yellow fever. The analogies illustrating this position are innumerable.

Combination is necessary to produce all the forms of matter; almost every substance we meet with on earth is but a temporary compound of ultimate atoms, to be hereafter resolved into its original elements —these again to be re combined with other forms and according to other laws—scarcely anything exists in its elementary condition, in any department of nature without it; and all the forms of organic

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* *Vide ut antea*—records of the Academy of Medicine, New York, p. 55.

matter, and everything that is of a character denominated *specific* is combined in proportions that are *definite.* No other proportions can constitute them; not only is this so, but a condition, or third ingredient, is usually required for this union, to give it this specific quality: thus oxygen and nitrogen may be mixed together in the definite proportions to constitute atmospheric air; oxygen and hydrogen in the atomic proportions to form water; yet these last results will not take place, unless pressure or electricity, or some other means be used to effect it. Chlorine and hydrogen, when mixed together in combining proportions, will not unite chemically in the dark; by exposing them to sunshine for a short time, they immediately combine with a violent explosion. Chlorine, when exposed alone to sunshine, seems to absorb the actinic principle, and now when mixed with hydrogen, unites with it in the dark.

The combinations to which I refer are believed to be the result of the putrefactive process—a class of chemical actions, different in form and manifestation from ordinary decomposition;* and this may be one of the principal reasons why yellow fever is mostly confined to cities. These actions are dependent for precise results upon *identical* conditions; where these vary in the slightest degree in the quantity of heat, light, moisture, and more or less of oxygen, &c,, &c., the products ever differ. But these are nature's mysteries. Chemistry is replete with similar illustrations, and Leibig has extensively demonstrated them through his valuable labors. The analogy in the varying conditions resulting in combinations to produce disease, is palpable enough, and these precise agencies will, one day, probably, be pointed out, in the one case as in the other. It is precisely thus, most likely, why filth, heat, moisture, &c., may sometimes co-exist, and the disease not always be developed. According to these views, the true cause of yellow fever—the *causa causans—must be* some combination of the elementary forms of matter in definite proportions, and that these really form the "contingent condition," the "occult mystery," which has caused so much puzzle and speculation. This is that combination of terrene and atmospherical causes mentioned in the text, and, no doubt, a similar union consti-

* Leibig describes "putrefaction to be the process of fermentation in organic substances containing nitrogen and sulphur, which give rise to the formation of products of a disagreeable odor."

tutes the perennial origin of the whole zymotic class, each requiring and having their definite proportions. The grounds for this origin from the same constituents is set forth in the supplement, pages 274–5, &c., to which reference is invited. If we make a distinction between a poison and what Dr. Simon (in his distinguished report to the Board of Health of London) calls "rather the test and touchstone of poison," it will be readily comprehended what I mean by the *tertium quid*—the means—the essential—the "*combination*" for effect. This is what is so often called the "ferment," the "spark to set the materials on fire," &c. The "test and touchstone" is filth and impurities and aberrations of hygienic observances. When the atmosphere is in a fitting state, with this ripeness in the terrene, we require no farther "poison."

The forms of matter to constitute the specific diseases—small-pox, measles, scarlatina, syphilis, &c., *must be* a combination of materials, which do not often meet in unison to form these elementary diseases, or we should much more frequently see them break out spontaneously, and we call *them* "accidental," because we are ignorant of the proportions requisite to produce them; but then, surely, no one now believes that all the "germs" of these diseases which at present exist on the globe, buried, as they are, in the obscurity of the past, are or were derived from the primitive nativity or first combination, and that like the human species, they are all derived from an original unity! We from time to time, hear of their spontaneous occurrence under circumstances which render it *impossible* that such a succession should have taken place; or that the nativity could have been otherwise than spontaneous—and this only means the meeting of the elements in the definite proportions required to form the combination. These diseases first occurred in warm climates, and of course certain meteorological ingredients were necessary to produce them; they occurred under circumstances, and mainly with a population almost utterly regardless of all hygienic observances, and, of course, filth, in its widest acceptation, an essential ingredient, was not wanting, and the combination was due to circumstances which may be forever hidden from human observation, as much as the object to subserve, may ever be concealed from human intelligence.

It is now admitted by the principal advocate* for contagions, miasms and germs, and foreign importation in yellow fever, that the typhus and typhoid fevers, measles, whooping-cough, and even small-pox itself, may be generated spontaneously (that is, without foreign importation). and that sporadic cases of yellow fever may be of similar origin also. When it is admitted by all sound practical men that there is no real difference between sporadic and endemic, or epidemic fevers, but in the more or less *extent of the causes and conditions* under which they appear, this is virtually giving up the whole ground. A disease admitted to be of *spontaneous origin*, is *necessarily indigenous*—it is of local and domestic birth—although allowed to be *susceptible of importation with the atmosphere which generated it.* Its contagious, or apparently contagious properties, depends upon its mode of propagation, if this requires an incidental or contingent condition, if it is only propagated under circumstances similar to that which gave it birth, then it cannot be considered a contagious disease under the signification of the term ascribed to it by medical men. But, if it produces the identical disease *under all circumstances* and *wherever transported, like the small-pox*, independent of any coefficient, it is admitted to be contagious. Tried by this test, the advocates of the contagion of yellow fever have signally failed, and the cases copied from one publication to another, as illustrative of their views, have been disproved over and over again.

It will not do to say that here has been a case of yellow fever, and there another, and that the conditions pointed out *in general experiments* have not existed. These cannot be expected to apply to each house, room, yard, or individual, but only to *such conditions as would influence or be a fair exponent of the climate of the place.* Our position and reasoning upon it, applies solely to the disease in its general or epidemic form, as so often expressed, and any single cases, or less than an epidemic, must be applicable solely upon the conditions accompanying them.

With this explanation all the cases so ostentatiously paraded before the public, occurring under other conditions than those announced as required under the epidemic law, fail of their application.

This eclectic view of the subject is corroborated by all we know of

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* Vide Charleston Journal for Nov., 1856

causation. It is not merely a mixture which is meant, but truly *combination*, and of course in definite proportions, in obedience to the great law which has been so beautifully denominated "the marriage of the elements," and which consists of a union of their respective elements in *definite proportions* (as of those diseases specified above). Now, there can be no reason why the causes productive of yellow fever should form an exception to this *evident law*, nor any of the malignant diseases to which man is subject. Let us pause and reflect for a moment how beneficent this is in our great Benefactor, who permits evils to inflict our race, but has ever left it in our power to resist their action or arrest their development, by the appropriate exercise of that intelligence with which he has endowed his creatures. Of the various links necessary to form that chain, or to constitute that combination, remove or destroy one and the effects cease, or do not appear. Here, then, the kindness of Providence places all communities on the same level, and puts under the control of man's intelligence, everywhere, his own interests and his own destiny. Any other view of the subject leaves us without hope, an "occult" and "mysterious agency," "a germ" of which we know nothing, is a barrier to all efforts at improvement, and leaves us to the accursed fatalism of the bigoted Turk—somewhat analogous to that in which our own beloved city has been left so long, and here the example is so striking, as not to need further illustration.

Now all this is clear and reasonable enough and cannot be got over. The same thing, as evidently occurs in the whole class of zymotic disease, at least, if not in others. It is probable enough that specific diseases have special causes, that is, certain combinations which may occur, often or rare, dependant probably upon the number of elements necessary in the combination.

The variation of diseases in different climates, as plague in the East, yellow fever in the West, and the peculiar fevers of the coast of Africa and at Chagres, depend upon the same circumstanes as give varieties to plants, trees, animals; these are the peculiarities which characterise different climates, and consist more or less of heat, moisture, electricity, solar radiation, &c. To the solar beams in their different and constantly varying qualities and powers, as exhibited by an analysis of the solar spectrum, it is evident we must ascribe the greatest agency in the production of diversities of climate, and its influence in the production of disease must not be overlooked. The constitution of the atmosphere being every where pretty much the same, consisting of moisture, mean temperature, &c., the special qualities of vegetation, the germination, growth, color, and every quality they possess, nay their very vitality, are due particularly to the different rays of the solar spectrum.

The beautiful exemplification furnished by the vivifying sun-beam will serve a double purpose while I refer to it, not only in illustration of the subject before us, but of farther explanation of the influence of solar radiation on yellow fever. It is now well known that the solar ray is formed by a combination of three principles, viz: heat, light, and actinism, each endued with separate and independent properties to accomplish important purposes in the great laboratory of nature. Through it is developed the actions of all animated beings, nay the inorganic world is influenced by its chemical and molecular disturbing power. One decks with resplendent and variegated color the beautiful foliage of the forest and garden, and even mantles the cheek of beauty with the fine glow of bountiful life; while another preserves animation even during an arctic winter, causes the wind to arise, waters to flow, and gives to tropical regions their gorgeous and boundless fertility; while the actinic or chemical principle not only bids the seed awake and quicken in the plant, but acts on inanimate as well as animate bodies. Thus, on experiment it has been found, on an analysis of the solar spectrum, when a thermometer in the blue ray indicates 56°. in the yellow it will exhibit 62°, and a little beyond the red, 79°. That these principles vary among themselves in activity and power, according to latitude,—season, and even during the day is unquestionable. Thus during the existence of yellow fever, the red rays may be elevated to an abnormal degree so as to produce that remarkable *burning sensation*, the peculiarity of a yellow fever atmosphere, and from the rapid developement of the chemical principle at these periods, it is probable that the actinic rays or actinism, are much increased. Daguerreotypists, on inquiry, inform me, that the sun's rays are more active at these periods, but do not make so permanent an impression. In the climate of England the quickness of production is a hundred times more favorable to the photographic art than in the brightest region of the tropics. In Mexico and Yucatan the failure in this art has almost been complete, except during periods when the sun's rays were more or less obscured. Light and actinism being regarded as antagonistic powers. This is in accordance with what has been said in the text (at pages 90—91, &c.) in relation to the comparative amount of solar radiation at the north and the south: that it *increases* with the latitude (certainly in some of these principles) is now shown in their analysis. I have taken the solar temperature in the mountains of Tennessee, about latitude 36° in July, and found it at midday 145°, while the temperature in the shade was scarcely °70! and that here its elevation during yellow fever evinces an abnormal condition far exceeding that due to the latitude, I have no doubt, and the record shows it. Another illustration is found in the farther penetration of the sun's rays (that is, the red or heat producing) into the earth at the north than at the south,—thus, while at the tropics the line of *invariable temperature* scarcely exceeds a foot—about 40° N. latitude it is 30 or 40 feet, or more.

These several principles in the sunbeam are constantly changing their relative powers and capacities, not only as successive seasons demand their special influences over the vegetable world, but for their daily growth, color, and maturation; the juices of all vegetable products derive their highest flavor from the rays of the sun—plants and fruits will not fully ripen without them. Indeed, each day these three principles are shed upon creation in varying proportions. There is clearly an abnormal as well as normal condition of them, and there is no reason why they should not affect the health of man as well as vegetation. Whether this influence be through some electrical agency, as supposed, or some other less equivocal, the explanation furnished through an analysis of the solar spectrum is sufficient for our purpose. Even the inorganic world is not independent of their influences; the granite rock which presents its uplifted head in firmness to the driving storm—the stones which genius has framed into forms of architectural beauty—or the metal which is intended to commemorate the great acts of man, and which, in the human form, proclaims the hero's deeds and the artist's talent, are all alike destructively acted on during the hours of sunshine.* So powerful an agency in the vegetable, and even the inorganic kingdom, cannot be without its influence upon our *well-being* too. Through the different qualities of

* Chambers

the sun's rays is acquired the great life-giving property to the earth, and through it are the differences and changes of climate. Has it these prodigious powers, and its modifications do not still modify the *health of man?* Let us then not hesitate to prosecute our investigations into this interesting and fruitful field of scientific inquiry—richly will it repay the persevering student by practical results.

But there are many diseases which do not require this combined cause to have their influence on the system, meteorological agents alone being needed for the purpose, and it is of incalculable service to the practice of physic and humanity to be able to ascertain the *certain cause of any disease.* Among these is very properly mentioned by Professor S. B. Hunt what has been denominated *coup de soleil.** This I have demonstrated to be independent even of direct solar influence, and to be the result of high temperature (shade) and high saturation.

To this I am very much disposed to add cholera infantum. It is known to be most prevalent soon after the first advent of high temperature in summer. It occurs in cities mostly, and in their closely built parts with abundance of hot stagnant air, and it is almost at once relieved by cool weather, and particularly country air.†

To these may be added pleurisy, catarrh, pneumonia, rheumatism, &c., &c., as requiring no other special cause, or co-efficient, than meteorological conditions; and to these we can surely often add intermittent fever. And as experience becomes enlarged, and more attention directed to the cultivation of meteorology, and its connection with disease, more developments will be made. The area is broad, rich and inviting, and replete with important and lasting consequences to our race.

In a science like medicine —dependent upon observations, we want facts, well-ascertained facts; we want enlightened experiments and observations of all the phenomena, attendant on the fatal form of disease,

* Vide address to State Medical Society.

† The immense and disproportioned mortality during infantile life which occurs in summer in cities, and particularly if the season shall have been unduly warm, must have struck every observer. It is, no doubt, aggravated by defective and improper nourishment, and particularly by bad milk and constitutional weakness, but the cause is as stated above, and results from their delicate organizations and their great susceptibility to changes of temperature.

under discussion (as well as all others), which has hurried to an untimely grave hundreds of thousands of our countrymen, and blasted the reputation and growing prosperity of some of the finest portions of our country. With a corps of competent observers, a uniform occurrence of facts will constitute laws, and medicine will then stand upon the same impregnable basis as chemistry and astronomy. The present defective condition of the science (in relation to this disease), arises from the imperfection of observation and records, rather than from the intrinsic obscurity or difficulty of the subject itself. Why should we not have formulæ and reasons in physic, as in what is called the exact sciences? If there are more elements required to ascertain results, the greater skill and ingenuity is called for to combine and eviscerate the truth from them. It is extraordinary that a profession which enumerates among its cultivators some of the most profound and acute minds of the age, and who readily take the highest position when joining any of the sister branches of science, should in the cultivation of this field, find obstacles which are not found in them. There must be some defect in the fountain-head whence flows this difficulty; medical education must be defective, where it does not satisfy or give proper direction to the inquiring mind, or embrace in its teachings all the branches of the science; this yearning after the higher elements of knowledge requires training, discipline and direction, or it will be groping, like the blind Cyclops around his cave. It belongs to teachers to form that early bias of mind—to give that direction and discipline, while after-cultivation prepares it for that elevated intellectual period, now so rapidly approaching. I believe I can say without fear of contradiction, that in relation to etiology, the basis of *preventive medicine*, it is hardly taught in the schools of this country at all. Now, this is infinitely more important to the community than curative medicine; preventible diseases being proportioned to non preventible, about as 8 or 10 to 1.

The foundation of etiology must be derived from a proper study and understanding of climate, with the conditions influencing it—temperature, humidity, light, electricity, &c., as all these have their effect on the health of man. These are not limited in their influence to morbid action. Not only agriculture, the first and most important pursuit of man, is entirely dependant upon them, but a very large portion of the comforts and even the moral and mental standing of nations are materially influenced by them. Not only national habits, peculiarities, and pursuits derive their direction from climatic conditions, but the temperaments and thence the intellectual developments of an entire people are much modified by them. Throughout the whole economy of nature a certain amount of specific heat, moisture, solar radiation, &c., are needed in her operations. Should it then be deemed extraordinary that aberrations from these very natural and indispensible requirements should produce disease, and that the forms of morbid action should vary according to climatic conditions, as everything else does? It would be the operation of a constant miracle were it otherwise. Is it of no consequence then that these should be thoroughly understood, and that the agencies influencing them should be extensively investigated?—nay, the high value which a proper estimate of it furnishes should take it from the irregularity and uncertainty of private enterprise and pursuit, and eminently entitles it to national consideration. This to most medical men, however, extraordinary as it may seem, is really an occult science; few pay the least attention to it, or, may be, deem it of any importance. In illustration of this I have in vivid recollection an interview with a highly intelligent friend and well-known medical author, some years ago, in which I was in vain endeavoring to explain to him Well's theory of dew; he could not be made to understand how it was that dew could be deposited in any other way than that of falling like rain. Now whether it was owing to my own dullness in imparting the proper explanation, or that of the entire inattention of my friend to this department of science, I cannot say—the failure was complete. I merely mention this to show how little the medical mind, even of the eminent of this country, has had its attention directed to this important branch of physical science. A somewhat similar instance is related of the most distinguished natural philosopher of the age (Prof. Agassiz), who could not be made to comprehend the product of two by two when both the twos were negative. But algebraic analysis and its mode of research, geometrical computation, would seem to form, paradoxical as it may seem, an essential part of that mental calculation in which he is distinguished above all men living. To me the paradox is not more palpable than in the instance I have referred to, forming, as meteorology does, *or should*, an important branch of our own studies and duties. And I do hope, if any advantage is to be derived from my labors, none can be greater than while casting in my humble mite, I may succeed in influencing the direction of the medical mind of the country to this important, but much neglected branch of physico-medical science. At present it is totally unprepared for the investigation and comprehension of deductions drawn from it, and unwilling to give it credit for data and principles, which it alone can explain. Hence it is we constantly see the most distinguished of the calling, as well as others, instead of making experiments, bring forward their personal recollections of what the meteorological condition was at any particular period, and in some cases, many years anterior, which no man who even keeps a record can himself burthen his memory with, without a constant reference to it, while others utterly ignore it as a basis on which to predicate important practical deductions. I repeat, then, that to understand etiology properly is to study with more care and attention meteorology, and thus the blessings of preventive medicine will be thoroughly applied by the profession to the amelioration of human calamity, and it will be then fully appreciated by the community. This is the true end of the philanthropy of the science.

He is truly a great bigot who is ashamed to confess that he has never erred, or rather that he is not wiser from having lived longer. Self-confidence, individuality, a willingness to be thought sometimes wrong, instead of living upon the reputation of being always right, *because stationary*, are most cheering evidences of progress wherever they are seen, and it would be gratifying could they be oftener exhibited in this department of the profession. The belief that there are no new truths to be evolved, no higher points to be attained, no more reforms in philosophy necessary to be made, is a living death to a scientific man, giving him a position intermediate between the great men of the past and the children of the present generation. The paralyzing belief that science is at its zenith has been, and always will be, an obstacle in the way of progress.

If the views and principles, advocated in this report, are worth any thing, it is mainly that their adoption tends to dispel some of the strange mysteries, which seem to hang as clouds over free investigation, into the important field they embrace. And I have great cause to be justly proud at the kind, cordial, and flattering reception my humble efforts have received from the liberal and enlightened portion of my own profession, and of those capable of appreciating labors in this department of knowledge every where—not only from my own country, but from Europe. Nor am I without willing and able coadjutors here, and I mention, among others, with as much pride as pleasure the names of my friends, Drs. Axson, Kennedy and Lemonier, who have nobly sustained me in my arduous labors, under no common difficulties. And I am flattered with the hope that our afflicted city will, ere long, test their soundness in their practical application, and that the principles established, and the example displayed, will extend their influence to other communities. This is the reward I have constantly sought for, and the consciousness that I was advancing this important step, has guided many of the weary hours of labor, and has buoyed me up in the brightness of hope in many a dark and almost despairing moment. Yet the original motive, without anticipating the important results investigation has led to, was simply the sense of duty imposed by public authority, and the partiality of my colleagues.

New Orleans, *March*, 1856.

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TO

PREFATORY REMARKS.

PREFATORY REMARKS.

The following Report has been re-issued, by the partial advice of some friends, to supply a farther demand of the public here as well as abroad—the first edition, printed by the City Council, and intended for private distribution, being now exhausted. The opportunity is embraced to fortify the positions taken in the Report itself; to extend its illustrations; and to give farther explanations of portions of it which have not been so fully understood as they might have been. The most material portion of this is embraced in a paper read before the "Academy of Sciences," of this city, defending the opinions and farther expanding the principles contained in the report. This paper is subjoined as a supplement. Therein is explained the difference between common mud and "original soil;" and the pathological and etiological differences between yellow and bilious fevers is shown to arise in consequence of proceeding from causes diversified in amount and expending their influence on different organs. This is illustrated by numerous analogies which the practical part of the profession furnishes us in the administration of medicines in doses differing in quantity in proportion to the effect we expect to derive from them, and that these medicines do really affect different organs precisely in accordance with their difference in dose or quantity. As that was written rather as a reply to an attack on the opinions set forth, the following views were not called for, but both are to be deemed supplemental and explanatory of the original report, and are placed before the scientific public for the reasons above stated.

The opinion is expressed in the report, that so highly injurious to health is the disturbance of the "original soil" of the country, when *the meteorological condition required to give it activity* is present—that it was considered one of the most efficient causes of every epidemic which has devastated the South-Western parts of the United States, at least during more than half a century. Since the publication of that report, public attention having been called to it, extensive corroborations have been given to it; some of which I will now proceed to record.

Natchez.—The fever of 1825 was satisfactorily ascribed "to the large deposits of fresh earth which were dug up and exposed to the sun, with which a wharf was made. The first cases of the fever occurred here. They were confined to the immediate neighborhood. By interdiction, and finally removal, it was put an end to."* July and August unusually hot and rainy.

"In 1837, streets were cut down to the extent of four or five feet, levelled, and the balance spread on the low lots in the neighborhood; soon after which, a most malignant fever broke out in the vicinity, and of a most fatal character. These remarks are equally applicable to various other points in the city, where recent openings had been made in the ground and fresh earth exposed to the action of the sun."†

Again: "in 1839 Natchez was visited by yellow fever, in an epidemic form, and as the Natchez and Jackson railroad had recently gone into operation, and much fresh earth exposed by the extensive excavations both in and near the city, the effects were clearly manifested by the prevalence of the disease along the line of the road, and the town of Washington, through which the road passed,‡ enjoying, heretofore, the reputation of [illegible]kable salubrity. The summers of both these years hot and rainy.

In Baton Rouge, 1827.—"The epidemic yellow fever of this year appeared at a time when several streets were being opened, and earth disturbed and spread on the streets, and assigned as the cause of the fever at the time."§

In Donaldsonville in 1827, (I think,) "the epidemic yellow fever

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* W. H. Pearce.

† Ibid.

‡ Ibid.

§ Dr. French, Senr., and Wm. Elam, Esq.

was ascribed to the erection and enlargement of a new levee, extensive digging of ditches, and spreading the materials on the streets."*

"At Terre Aux Beuf, great sickness and mortality produced at the period of the excavating for the Mexican Gulf railroad, during which there was extensive digging and exposure of swamp mud."†

At Wilmington, Delaware, the great epedemic yellow fever which devastated that place in 1802, was ascribed "to the streets being cut down and levelled, and the materials spread on them, in cellars dug and filled with water—the weather being very stormy, torrents of rain falling—much fog and misty weather, and the *disease seemed communicable as far as the fog extended*, BUT NOT BEYOND IT!—disease aggravated by any addition to moisture in the atmosphere."‡

Columbia, South Carolina.—"The digging of the canal near the town in 1819, is well known to have greatly increased the amount and severity of the fevers of this usually very healthy locality."§

Savannah, Ga., in 1817–'20.—The severe epidemic yellow fevers of these years are thus accounted for by Dr. Daniel:‖—"Heavy rains, alternated by a hot sun—soon after the commencement of this weather, the City Council turned their attention to *the levelling of the streets*, contrary to the express objections of several medical gentlemen. In this process the refuse and offals of our yards and kitchens, which, for years had been permitted to accummulate gradually in mounds (where they were comparatively innoxious,) were, with a prodigal hand, *distributed upon the streets* and subjected to the influence of heat and moisture of the summer season. In addition, earth *was deposited in the depressions of the streets and lanes*, for the purpose of l[illegible] them, which, mingling with the falling rains, produced [illegible] muddy and offensive places."

Do., in 1854, Dr. John F. Posey writes me, "That the earliest cases occurred of the epedemic fever of this year, in the neighborhood where the streets, and a square in front of them, *had been filled up*, to a level above the lots, which are occupied by as many small wooden houses as

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* A. S. Phelps, Esq. † Ibid.

‡ See account of this fever by Dr. John Vaughan.

§ Dr. N. W. Gibbes. ‖ In his work "on the Fevers of Savannah."

could be crowded on them, and which, on the commencement of the epidemic, were occupied by an incredible number of people—that the small space or yard-room had been planked over, on account of the mire caused by the rain water from the houses and streets, and that the boards were rotting, that under the houses, which are all very low, there were large collections of trash, chips, &c., rotting, and kept wet by the frequent rains, producing a stench which added to the effluvia from the rooms, was very offensive. From thence the disease extended over the city." How much like various parts of our city in 1853–'4!

In Buffalo, N. Y., Professor Hamilton clearly traced "the production of cholera, in 1852, to the influence derived from upturning the earth, with a stagnant, and, of course, humid atmosphere."

Louisiana.—Dr. Halphin, in his minute and graphic account of the cholera in this city and adjoining parts of the State in 1832–'3, ascribes it, most especially, to the vast exposure of the original soil, from digging the canal of the bank (referred to in the report,) and gives instances, as occurring in the interior of the State, where a similar exposure on plantations, was accompanied with a frightful mortality, both among the slaves and white people.

This subject might very well be left here, not only from the amount, but from the numbers, variety, and respectability of the authorities, and could be greatly enlarged, not only from the experience of our own country, but from various foreign countries. Farther testimony is deemed superfluous. I wish it to be distinctly understood that I have never said or intended to convey the impression, that this alone would produce disease; that, acting in a manner equivalent to filth, it only constituted one of "the blades of the shears of fate;" that the other (the meteorological) was indispensible to combine with it, in order to produce the effect. No instance has yet been mentioned, where these two combined their influences, and the results, as alledged by us, did not ensue—*provided there were susceptible subjects exposed!*

When a principle is established, a key is found to the explanation of a vast variety of phenomena—it is both the pilot and chart, which leads us to and teaches us great truths. By adopting the principle, that it is only during a certain range of the dew-point, (which is a mere measure of the amount of moisture in the atmosphere,) that certain diseases occur, we understand how it is, that in most insalubrious climates and seasons, a fire in a room protects the inmates from the influence of undue moisture, by lowering the dew-point, as is often done in this country. In Sierra Leone the natives have a practice, during the sickly season, of keeping fires constantly burning in their huts at night, assigning for it, that "fires keep away the evil spirits." Captains Cook and Peyrouse preserved the health of their crews, in their long and perilous voyages, in the most sickly regions, by drying and ventilating by fires, between the decks of their vessels; and the only successful voyage to the interior of Africa ever recorded, doubtless owed the salubrity which accompanied it, to the same cause. Thus, too, the night air is more dangerous than the atmosphere of the day. In all these cases, heat expands, dilutes, and promotes the escape of deleterious gases, (when these are limited and confined,) lowers the dew-point, and enables the skin to deplete the surcharged system of noxious ingredients.

It is an error to suppose that only the amount of aqueous vapor emanating from the body is influenced by the state of the dew-point. *All secretions* proceeding externally from the system are so influenced—as is perfectly obvious to all, who attend to their condition, either in their own bodies, or those of their patients, particularly during the seasons when the causes are sufficiently aggravated to produce an epidemic. The effluvia from *all* (particularly from the sick) is most obvious, and which no ablutions will entirely remove, but temporarily. We shall show, presently, that the most noxious of all substances to the human body is its *own worn out materials*. A high dew-point, and a stagnant atmosphere prevent the elimination and evaporation from the body of these offensive excretions, and in proportion as these are retained, the body becomes *protanto* to its own poisoner, besides being influenced by all the conditions without. The most careless observer during malignant epidemics, cannot overlook these clearly demonstrative conditions. They are recorded in the following pages, in every exhibit of the daily atmosphere and mortuary condition. A high temperature, a high dew-point, stagnant atmosphere, close rooms, and a patient reeking with offensive perspiration, will carry conviction to any mind, not closed against it by prejudice, or insusceptible from incompetency. So offensive are these odors often during the existence of yellow fever, that many physicians are induced to believe that they are *diagnostic* of the disease external.

In relation to the influences ab externa, a very striking instance occurred to me during the epidemic of 1854, which I will relate. Being called some distance up the river, while it was raging in the city, on returning, I had to take a steamboat containing much live stock, (hogs, sheep, cows, &c.) The boat was, from this cause, offensive beyond conception, and I remarked to my companion, a professional gentleman, that there would, probably, ensue considerable mortality from it, after we reached New Orleans. In the course of a few hours, a considerable change in the weather, rather suddenly, occurred ; a fall of temperature ensued, (and, of course, the dew-point,) and all the offensive odors at once subsided. Nor could they be perceived in any part of the boat. Having accidentally omitted to bring my hygrometer with me, in vain, sought a thermometer to take the dew-point. In a couple of hours we reached the city, and I immediately proceeded to take the dew-point, and found it about 60 degrees. From this period the epidemic retired. It is to be remembered, that this is about the degree that the report states that the epidemic usually retires.*

As to the philosophy of it, or the mode of action of a high dew-point, retaining the effete matters in the system, we are not at all at a loss. It is evidently a *law of being*, in the constant changes which are ever occurring in all organized matter, which designates it as different from the inorganic, *viz.:* that materials once used, are no longer fit for the purposes of life *of that being ;* it must, then, pass on through the circle of created things, before it can become again adapted to the necessities of that individual ; and it is now an excretion. It has performed the part allotted to it. It is the effect of a high dew-point and imperfect decarbonization of the blood, by a subtraction of at least one-fifth of the amount at a temperature of 80 degrees, from what there is at 60 degrees, besides what influences the system, through the cutaneous envelope, to cause the retention of these now noxious materials. Whether this is done as the result of excessive action, as stated in the text, it is necessarily accompanied with diminished power and tonicity, speedily resulting from the condition, and the consequent elimination does not

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* Vide table in the Introduction.

take place. As a result of this state of things, the surface is kept hotter with sweat, evaporation does not take place; there is an offensive atmosphere surrouding the individual; there is great torpor of the capalaries, and the system is laboring under a load of effete and poisonous materials. Such is constantly the case in that atmosphere surcharged with an amount of impurity sufficient to give origin to epidemic fevers. In the chronic diseases of hot insalubrious climates this influence is displayed in a very striking manner in the "bombicinous" aspect—the pumpkin colored appearance of the skin of the natives and long residents, in their enlarged spleens and diseased livers —the chronic intestinal affections and general torpor of the body (and too often of mind;) and a very striking proof of the correctness of the principle and its explanation, is derived from the success of the mode of remedying it. Health is known to be best sustained in these climates by acting on this very surface; by a free use of the bath and coarse friction, by cleanliness, a regular life, and early morning exercise, when there is known to be more ozone in the atmosphere.

That a large amount of moisture is essential to the production of fever, and *that none occurs without it*, whatever may be the temperature, has been so fully impressed in the report, that farther proof is deemed superfluous. As illustrations are, however, sometimes more striking to the mind than the most direct proof, I will furnish some. It is well known that the high temperature of sandy deserts, never produces *fever;* that the fiery blast of the Harmattan which desecates the fluids, and withers the whole aspect of nature, *puts an immediate end to fever*, and that on the coast of Africa, after the rainy seasons, they welcome this blast, as with it the recovery of invalids commences. It is clear that the presence of undue moisture was the prevailing obstacle. There are some valleys wherein the foot of man has never trod and, returned from alive, and which are whitened with the bones of the victims of temerity. These are the true types of the "valley of the shadow of death." Several of these are known to exist in tropical regions. They are evidently made so by the condition referred to. They are deep; ventilation cannot reach them; a stagnant and of course a damp air, forever hangs over them, and hence, their fatality to human life. The temperature of some deep valleys in Africa has been actually found as high as 118°. It is very probable that the dew point must have been about 90°—evidently incompatible with a lengthened continuance of existence.

It is well known that malignant fevers do not occur in elevated regions, even in the tropics, and Baron Humboldt places the limits at 2500 feet. The reasons assigned are not very clear or definite. It is easily accounted for on the grounds set forth—from the amount of humidity essential for the prevalence of such fevers, being absent. I found the *humidity* at Jalappa (in Mexico), whose elevation is a trifle less than that above stated, to be in early Nov., at *sunrise*,* .606 } Saturation
and at *midday*, .566 } being 1000

At the City of Mexico, whose elevation is about 7500 ft. above the level of the sea, I found the *humidity* in November and December, to be at *sunrise* .685 }
and at *midday* .378 } do.

It has been asserted by very respectable authority that "the mean dew-point of the *summer* in the United States is 15° above that of *autumn*." What part of the "United States," is not stated. In *this* part of the United States the difference is less than 2°, on an average of near 10 years, and that difference is derived solely from comprehending in it our very dryest month, *viz.:* October. But if we compare the dew-points of the two months of June and July with those of August and September, the difference is only about one-tenth of a degree. It is, however, a *general fact* that the highest dew point occurs in the sickliest month, which is almost always August in this country. The same occurs at Rio Janiero, and it is believed wherever the yellow fever occurs as an epidemic, and records have been made of it.

We shall see in the report that the rule in relation to the amount of temperature, necessary for the existence of yellow fever in Philadelphia, is at a lower rate than what exists in this climate—the same rule doubtless applies to the dew-point. There are peculiar climatic conditions applicable to every country, to constitute the seasons of each normal or abnormal; what is normal to one would not be normal to another in different latitude and condition, and the consequences resulting to each

* Am. Jour. Med. Sciences, 1846, p. 107.

of these must be judged of *mainly* by its own standard, although the principles are the same. But where the climates, latitudes and conditions are similar, the same general rule should be the standard of comparison. Thus, in relation to Savannah, the only place from which I have been able to procure the records in detail to apply the principle to, (and it is for the disastrous year 1854), it will be seen that by the annexed table, and by comparing it with that in the "Introduction," in which the meteorological elements deemed essential to the existence of epidemic yellow fever here are stated, that not only a very great similarity, but almost identity exists between them, thus verifying the principle referred to.

I have used every exertion to procure the requisite records, from other places for the purpose of a more extensive comparison, so as farther to verify or refute the opinions expressed, but hitherto, unsuccessfully.

The Meteorological Elements Prevailing at Savannah, Ga.,

At each of the several epochs of Commencement, Acmè, and Declination of Epidemic Yellow Fever there, during the autumn of 1854.

1854.	TEMPERATURE. General average at			TEMPERATURE IN SUN. Average at			DEW-POINT. Average at			BAROMETER. Average at			WINDS. Pre dominate at			HUMIDITY. Average at			DRYING POWER. Average at		
SAVANNAH, GA.	Commencement.	Acmè.	Decline.	Commencement.	Acmè.	Decline.	Commencement.	Acmè.	Decline.	Commencement.	Acmè.	Decline.	Commencement.	Acmè.	Decline.	Commencement.	Acmè.	Decline.	Commencement.	Acmè.	Decline.
August 17—20, *Beginning*,	79.44						71.78			30.169			S. S. W.			.810			7.79		
Sept. 10—14, Maxim. or *acme*,		84.14		No record taken—but said to be very high.				79.44			30.282			S. S. E. S. W.			.790			4.70	
October 27—31. *Declination*,			69.60						64.91			30.123			S. E. N. N W.			.855			8.08

During the worst month, September, 7,457 inches rain fell.

During the worst month, September, 790 was the mean humidity.

The *greatest storm* that ever visited the city since its settlement, occurred in the evening of the 7th, and accompanied with heavy rains, ending on the morning of the 9th, immediately after which, the fever went up to its maximum—during which, there was much thunder and lightning.

Hurricanes are said to put an end to yellow fever in the West Indies, "as frost does in America"—or rather a depression of the dew-point to a certain degree. Here it seems the very reverse took place, and that the acmè or maximum intensity of the disease immediately followed. It will be seen, hereafter, that stormy weather has a very injurious influence on those affected with yellow fever.

(For the statements from which this table has been compiled, I am indebted, through a friend, to Dr. Jno. F. Posey, of Savannah, to both of whom I return my sincere thanks.)

In bringing these observations to a close, it may be instructive to make a resumé, to see what opinions and principles are entitled to be deemed established or sustained, and to offer them to the fair and candid investigation of my professional brethren, to whose examination they are presented, with the hope that they will apply the same *personal tests and trials* that I have bestowed upon them, before they give their final judgment of their value. Our science is a progressive one; its great principles are only to be reached through the rugged paths of *experiment and observation;* speculation is but another name for guessing and conjecture. Its path is paved with false facts, enlightened only by the occasional glare which genius and ingenuity cast upon it, and will only tend, as it has ever tended, to throw doubts and cast clouds over a subject of the dearest interest to the welfare of our kind. Let us discourage these, and the great truths of the science will be vouchsafed to us in time, if not now.

1st. That the epidemic yellow fever has never occurred here (at its commencement) but during a high dew-point (the minimum being upwards of 74°). In Savannah last year it was almost 2° less, and continued for some time.

2d. That it has always ceased, as an epidemic, before it descended as low as 58°. In Savannah last year, it terminated when it was a fraction less than 65°. In 1848, here, it ceased at about 1° higher, although the average of a series of years was, when it reached 62° 12'.

3d. That at temperatures of the dew-point below these, sporadic or endemic yellow fever may occur, but it is not known to have existed here, with any certainty, as an epidemic, when the dew-point differed from that above stated.

4th. That what is miscalled the CONTAGION OF YELLOW FEVER, or its liability to spread, exists *only with the first condition.*

This, at once, strikes at the root of all contagion in yellow fever, *per se.* No one pretends that *sporadic* or *endemic* yellow fever is contagious! *Do these differ from epidemic yellow fever in their natures?* No one has the hardihood to make any such pretension. A change of air which suddenly lowers the dew-point to near 58 degrees, (here) if continued, puts an end to epidemic yellow fever; a crowded population may enter the city, occupy the houses, rooms, nay, the very beds, which lately reeked with yellow fever, yet not an instance, which can be attributed to contagion occurs. The filth, the miasm, and all the "terrene" matters, are just as before. *But one change has occurred*, the connecting link, the combination, has been broken—the *meteorological element* is *wanting*, and the *effects* are no longer present. Can anything be more conclusive? Where is the contagion now? Does a few degrees of temperature less, at once, disarm the giant that has been mowing down, but a day or two before, his countless victims with his remorseless scythe? The "contingency" exists no longer. Such a misnomer is applied to no other disease. "Sober second thoughts," and sound judgment, worthy to enlighten and guide this people, will not apply it here when its unsoundness is thus exposed.

5th. That the main controling influence in all unhealthy situations is MOISTURE, whether in cities, towns, countries, ships, or dwellings, although filth and heat are to be deemed correlative.

6th. That MALARIA is not any one specific thing, but that all impurities of the air, and organic matter in decomposition, are liable to influence injuriously, the organism, and particularly the worn out excreta of human beings may be so denominated, and is particularly incompatible with healthy action, and when in combination with the meteorological condition, may produce yellow fever.

These, if future researches shall confirm our observations, are all deemed of inestimable importance to society—and the more so, if they shall be found to apply to other climates and conditions.

The views, principles, and opinions, embodied in this report, I am proud to say, and have the honor to acknowledge, have received the approbation, sanction, and endorsement, of many of the most distinguished scientific inquirers of our country, and some of these testimonials are, by permission, placed in the antecedent pages of the work.

REPORT

OF THE

SANITARY COMMISSION

TO

HIS HONOR J. L. LEWIS,

MAYOR OF THE CITY OF NEW ORLEANS;

AND THE

HONORABLE THE MEMBERS OF THE BOARDS OF ALDERMEN AND ASSISTANT ALDERMEN.

GENTLEMEN:

You will be pleased to accept herewith a Report embodying the results of the labors of the Sanitary Commission, upon the special and various matters committed to their charge by the Council. The delay in presenting it, is ascribable almost entirely to the comprehensiveness and thoroughness aimed at, in gathering from all sources of sanitary intelligence, here and elsewhere, the facts and phenomena deemed useful in tracing and attesting the origin and causes—the atmospheric and terrene conditions—the transmission—duration and expulsion of that formidable disease—the yellow fever. No opportunity has been slighted—no toils have been spared to push our explorings and researches throughout the vast realms of the yellow fever zone, in both South and North America, and the West Indies, and the voluminous sanitary data prefixed to our Report, are our vouchers for the magnitude and extent of our labors. Even since our Report has gone to press—most valuable accessions, in response to our circulars, have been received from abroad; and we are still farther assured of valuable testimony on the way to us from distant fever regions worthy of all consideration and respect.

Out of these data, together with the experience of many years, have grown the materials which form the opinions and principles put forth in the Report, as to the origin and causes of yellow fever, of which no more may be said at present, than that two of these principles will be found of inestimable value after experiment and experience shall have fully tested their soundness and infallibility.

The one is that yellow fever is and always has been, here and elsewhere a *preventable disease*, and

The other is, that the presence of two general hygienic conditions are absolutely indispensible to the origination and transmission of the disease —the one of them, atmospheric—the other terrene. These must meet *in combination*, or there will be no result. The absence of *one*, as to *this* disease, is as the absence of *both*, and as one of these conditions is almost wholly within the control of man and the other partially so, it must follow that his power extends to its prevention and expulsion.

These two principles constitute the bases of all the preventive and remedial measures with which the Report closes, and which were specially devised for practical execution through the minstrations of the city authorities.

Throughout the several Reports we have constantly endeavored to avoid speculative opinions—to adapt all our principles and suggestions to practical ends, having the great object of our appointment—utility to our stricken city—ever before our eyes—as a polar star for our guidance.

With the presentation of this Report, the authority of the commission ceases. Its labors and its functions end together, yet its members cannot part with the voluminous record of their toils, without an expression of their entire and unwavering confidence, that, if the preventive and remedial measures they have recommended, shall be fully carried out, rigidly enforced and perseveringly maintained by the city authorities—it would be altogether impossible, for the yellow fever to originate here, or to be disseminated as an epidemic, if brought from abroad.

THE

JOINT AND SEVERAL FUNCTIONS

OF THE

SANITARY COMMISSION

During our late great epidemic, the subject of the sanitary condition of our city became a theme of deep concern and anxious scrutiny. The great malignity of the fever—its unparalleled spread, visiting places heretofore exempt from its ravages, all tended to arouse public attention, and the conclusion was at an early period arrived at, that the subject merited the most thorough and careful investigation.. Prior to this period the sanitary condition of the city had not received the attention its great importance required. We have had occasional Boards of Health, whose existence continued two or three years, with large intervals intervening, and being mere boards of record with little authority or means, but partial benefits resulted from them. Divers opinions had been expressed in the city journals with regard to the salubrity of the city. The public had been pretty steadily assured, by the authorities and others, that "the city was one of the healthiest in the Union, although subject to occasional epidemics." Confiding in these assurances, the great mass of the citizens took little part in the subject, being quieted and lulled into security by these representations. Our reputation abroad, however, from occasional exposures by Boards of Health and other sources, and above all, the great calamity of 1853, fully aroused the public, and induced the determination to look thoroughly into the subject, and through the urgent promptings of public sentiment, the Board of Health, (the only body then acting that had the power —the City Council having adjourned for the summer,) appointed the Hon. A. D. Crossman, Mayor of the city; Drs. E. H. Barton, A. F. Axson,

S. D. McNeil, J. C. Simonds, J. L. Riddell, to constitute a Sanitary Commission.

To this Commission were deputed special instructions for inquiry and investigation, viz:

1st.—To inquire into the origin and mode of transmission or propagation of the late epidemic yellow fever.

2d.—To inquire into the subject of sewerage and common drains, their adaptability to the situation of our city, and their influence on health.

3d.—To inquire into the subject of quarantine, its uses and applicability here, and its influence in protecting the city from epidemic and contagious maladies, and

4th.—To make a thorough examination into the sanitary condition of the city, into all causes influencing it, in present and previous years and to suggest the requisite sanitary measures to remove or prevent them and into the causes of yellow fever in ports and other localities having intercourse with New Orleans.

The Commission immediately organized and proceeded with due diligence to the fulfillment of the important task confided to it. It issued circulars embracing all the points suggested for examination, and distributed them among the medical faculty and citizens here and the adjoining States, and to every quarter of the yellow fever region, whence information could be expected to enlighten its judgment on the subjects to be considered. It sat as a Court of Inquiry in this city daily for about three months, eliciting and inviting information from every accessible source.

When this field had been sufficiently explored, it deputed its various members to visit different parts of this and the adjoining States where the epidemic had existed, to institute inquiries upon like matters and report upon them. One member was sent to visit the various Eastern cities, to obtain information of their sanitary condition, ordinances and usages. He was likewise instructed to visit Washington, to apply to the Government of the United States for aid in obtaining through our Diplomatic and Consular agencies throughout the yellow fever zone, whatever information our circulars called for, or that would advance the cause we were engaged in.

The readiness and courtesy shown by the Government of the United

States, the efficient aid and co-operation of the medical profession, and others here and elsewhere, the intelligence and readiness manifested by those gentlemen to whom our circulars were addressed, are sources of gratification to the members of the Commission, and it is our desire to state emphatically, that although much diversity of opinion existed, not only in the profession, but among others, whose evidence we have procured, from nearly every part of the yellow fever zone, as at present existing—we have conceived it our duty to receive and promulge them, and let the public judge of the propriety of the deductions drawn from them. The ample success which has followed our efforts to procure information is attested in the evidence and documents accompanying this. The reports on the subjects presented to our consideration, must speak for themselves, they are all herewith presented to the Mayor, City Council and the public, and we tender our kindest acknowledgments to the Secretary of State, (Mr. Marcy,) for the facilities he has furnished us in acquiring most valuable information from abroad from the highest and most valuable sources; and

To Mr. R. G. Scott, U. S. Consul, and Drs. Pennell, Lallement and Candido, at Rio Janeiro; Mr. W. Lilley, U. S. Consul, at Pernambuco; Mr. J. Graham, U. S. Consul, and Dr. H. W. Kennedy, at Buenos Ayres; Dr. W. Jamieson, at Guayaquil; Mr. S. Grinalds and Dr. Lacomb, at Puerto Cabello; Mr. N. Towner, U. S. Consul, and Dr. J. W. Sinckler, at Barbadoes; Drs. Amic and Chapuis, at Martinique; Mr. J. Helm, U. S. Consul, and Dr. Pretto, at St. Thomas; Dr. W. Humboldt, at Mexico; Mr. J. W. Dirgan, U. S. Consul, and Dr. Lafon, at Matamoras; and Mr. Pickett, U. S. Consul at Vera Cruz; and J. W. Dana, U. S. Consul at Lucre, Bolivia.

The duty of investigating the various subjects referred to this commission under the instructions has been duly distributed among the different members—to Drs. Axson and McNeil, the first; to Dr. Riddell, the second; to Dr. Simonds, the third; and to Dr. Barton, the fourth.

INTRODUCTION.

The Sanitary Commission, in fulfillment of the important trust confided to it, has deemed it one of its most urgent duties thoroughly to examine into the past state of the health of the city, so far as records could be procured to attest it. These have extended beyond half a century—although the records of many of the years have been sparse and imperfect. With occasional exceptions the results have proved very unfavorable to its health in the past; yet, as sanitary guides and beacons, they are regarded as full of promise for the future.

There must exist some cause for the great insalubrity shown in the mortuary returns. It certainly does not arise from its *cleanliness* and the absence of those sources productive of disease in every country. Then it must derive its origin from those conditions in which it differs from other places that are healthy. It must proceed from those circumstances which the uniform experience of mankind has found to be the cause of insalubrity elsewhere. Or shall we abandon as useless, all the dear bought experience of our race, and remain as we are despite our recent severe and bitter afflictions? Are we forever to turn our face upon the past, and to be made no wiser by its valuable teachings? The problem thus presented to us to solve is not a new one; it has been solved a thousand times before; we give it again, with the special experience derived from our locality and circumstances, and with the same uniform results.

The value of general hygienic regulations has been extensively commented upon in a subsequent report; that of personal hygiene is hardly less important; upon this depends mainly not only our personal comfort, but health; and it is in many cases the only substiute for sanitary regulations of a more general nature, affecting the entire community; and is of special value to us here where the latter have been so much neglected. That they are more appreciated than formerly, is shown by the remarkable fact that about half a century ago leprosy existed to such an extent in New Orleans, that it was deemed necessary to erect a hospital for its special treatment, (a quantity of land in the rear of the city having been appropriated for the purpose,) and there are still surviving among us those who have a lively recollection of that loathsome malady. It too, has yielded to the ameliorating hand of civilization and modern comfort, or climatic changes, and is now confined to the inferior grades of society in Cuba and Mexico. When the general principles of hygiene shall have been as widely extended over the city, our epidemic and endemic fevers will in like manner disappear, and we may again enjoy that salubrity which was once our wont.

The *causes* of this insalubrity have been most carefully scrutinized, and it is our deliberate conviction that they are fairly ascribable to local conditions which are mainly removable. A reference to some of them here, the principles applicable to them, and the recommendation for their removal or abatement, will not be inapplicable in antcipation of the Reports themselves.

Throughout the vast period to which this investigation has extended, commencing when the population did not exceed 8,756, (in 1796,) *no epidemic* has occurred that has not been preceded and accompanied by a great disturbance of the original soil of the country, (in digging and clearing out canals, basins, &c.,) although other local causes doubtless had their influence. This has been so unequivocal and so constant, and *without exception*, that it seems to the Commission to bear the relation of cause and effect. The proofs of it are furnished in the following pages, and might have been greatly extended in its more local influences. This disturbance seems to have generally taken place with great recklessness, manifestly preferring for the purpose the warm season, during which it is most dangerous.

We have to make the same remark in relation to the clearing and draining the neighboring swamps, both of vast public utility, and when done in a suitable season and proper manner, under enlightened advisement, not injurious to the public health; but most disastrous, when these are not faithfully observed, as medical annals for hundreds of years past fully attest.

The numerous undrained, unfilled lots and squares dotting the surface of the city, becoming muddy pools in the rainy, which is always the sickly season, and common receptacles for filth and garbage of all kinds, are exhibited in our *sanitary map*, and should be early abated.

The numerous low, crowded and filthy tenements, many of which are also indicated on the map, are probably as disastrous in the production of yellow fever as any other; they are common "fever nests," and are denominated "nuisances" of the deepest dye. They constitute the ordinary hotbeds of disease and death at every *epidemic period*, (yellow fever, cholera or what-not.) They have been signalized by a most fearful mortality. They conduce much to impair the reputation of the city for salubrity and they demand therefore the firm cauterizing appliances of the city government.

The extensive livery stables in the heart of the city, and vacheries near the thickly populated districts, and the vicinage of slaughter houses should be abated, as they strongly tend to impair the purity of the city atmosphere.

The present cemeteries within the city limits should by all means be closed against future use.

The kitchen offal and back yard filth, including the bad system and neglect of the privies, constitute some of the greatest sources of vitiated air, and require the most active agency and timely surveillance of the Health Department.

The system of sewerage set forth in the second report is confidently recommended as well for its economy as its promised efficacy.

The present mode of cleansing the streets is most defective; the time is inappropriate. It should be done, at least during hot weather, when the sun is no longer present to distil the poison into the atmosphere. The carts should in all cases *immediately* follow the scraper and remove the gathered garbage, in covered carts, and that taken from under the bridges should never be spread upon the streets. It had better be left where it is, protected from the sun.

None but the most superficial disturbance of the soil, or cleaning out of canals and basins, should be permitted during the hot season.

The bank of the river, the levee, wharves, and filth from the shipping, require a special police; they constitue some of the most pregnant sources of disease.

The effect of these various nuisances and others on the disastrous fever of last year, is fully set forth on the sanitary map with its accompanying exposition.

After the ample detail of local causes for our summer and fall fevers under a high temperature and the great humidity incidental to our position, it is scarcely necessary to say that we have a sufficiency of them, without looking abroad for the sources of our insalubrity. Nevertheless, in relation to the subject of QUARANTINE, although the Commission is unanimous in the belief that no system, however rigid or successfully carried out, can ever be a substitute for the sanitary or preventive measures we have recommended, and which if properly enforced, would be at once a protection against both the origination and spread of yellow fever and cholera among us, yet in the imperfection that must attach to all such measures, we unite in recommending the establishment of a quarantine station below the city, under the surveillance and control of the "Health Department," thereby preventing *all foul vessels* from entering the port with *diseased passengers or crew*, *placing the restriction only where it is a measure of safety*, and furnishing character and security abroad to our intercourse with other nations.

We are sensible there is great difference of opinion among the members of the profession and in the community in relation to the communicability of yellow fever, and have investigated the subject with great care in the following pages; and the conclusion we have come to, is that yellow fever is not a disease personally contagious, that its infectious properties are only communicable in a foul or infectious atmosphere; that is, that a foul vessel or individual with the disease, will only propagate it, under atmospherical and local conditions similar to that which furnished its nativity. That although vitiated or infectious air may be conveyed in goods and in various ways to distant places, ventilation speedily dissipates it, and that if disease results, when it is much concentrated, or with very susceptible individuals, it extends no farther, except under the conditions above specified. The occurrences of the last season, and we believe, all antecedent years, supply us with innumerable illustrations in the establishment and corroboration of these important principles.

But farther than this, the Commission has not remained satisfied with theoretical presumptive evidences. Most careful scrutiny into the actual occurrences of the first eruption of the fever, its spread, the character of its localizations. the persons most liable and suffering from whatever class and country, have converted presumptive proof* into positive certainty, that the fever originated with us, that its fatal malignity and spread was justly attributable to a very remarkable concurrence and combination of atmospheric and terrene causes, always peculiarly fatal to human health and life. These have been most amply examined and fully pointed out, and the gratifying fact is shown, that at least one of these causes is entirely under our control, and that it is in our power greatly to diminish the other, and hence by *disseverance*, the fatal union is prevented.

The Commission has taken great pains to investigate the climatic condition, to which our latitude and position peculiarly expose us, so far back as meteorological records would permit. It is impossible to overlook the fact that the meteorology of a place, is, in other words, its *climate*, and upon this mainly depends the character of its diseases, for these special liabilities are dependant upon conditions which constitute the difference between one climate and another. Were it otherwise all climates would have similar diseases, nor would varieties of season alter them. We have become impressed with the conviction, that much error has existed on the subject, and that the evils incident to our location can be greatly ameliorated. It may be probably premature at this early day of the practical application of meteorology to etiology, to venture into much very precise detail, with regard to the elements essential to the existence of the two great scourges of our city, (yellow fever and cholera.) But in the infancy of meteorological inquiry, as at all beginnings, there must be a starting point. The testimony we offer to the scientific public, is submitted with great diffidence, but as pioneers, we make our humble offering at the shrine of science, to be corroborated or refuted by subsequent observations. If true, we cannot over value their importance, if not, the experiments to disprove them will lead to valuable results.

We have essayed to show what are the precise meteorological or climatic elements, necessary for the existence not only of epidemic yellow fever, but of cholera; that is, to show what are the meteoro-

* The undersigned members of the Sanitary Commission, dissent from this assertion, denying the positive certainty alledged.
J. L. RIDDELL,
J. C. SIMONDS.

logical conditions under which they prevail, at each stage of their commencement, progress, maximum intensity and declination. The difference in the combination productive of yellow fever and cholera may be comparatively small, although the effects are so different, nor is this very uncommon or wanting in illustration in various departments of science or medicine. A change of wind, with a difference of five or ten degrees of temperature may produce the most fatal pleurisy, pneumonia or laryngitis. So, the same apparent condition produces a great diversity of effects on individuals of different physical susceptibilities, and a difference of one or two grains of moisture in a cubic foot of the air we breathe may, and often does result in the occurrence of the most fatal maladies.

The results we have come to, after a careful analysis of the records in this climate, at least, during the several years through which these are reliable, (and they have been made with great minuteness during the last twenty-one years, and corroborated as far as they go by those of every epidemic yellow fever and cholera that has existed in this country, of which there are any records; the more special details embracing nine epidemics of yellow fever and six of cholera,) are embraced in the following table.

CLIMATIC OR METEOROLOGICAL ELEMENTS OF EPIDEMIC CHOLERA AND YELLOW FEVER AT NEW ORLEANS,

AND COMPARISON OF THE METEOROLOGICAL CONDITIONS WHICH HAVE PREVAILED, DURING THE THREE EPOCHS OF COMMENCEMENT, ACME OR MAXIMUM, AND DECLINATION, OF THE EPIDEMICS OF CHOLERA AND YELLOW FEVER, ON AN AVERAGE OF SIX OF THE FIRST, AND FIFTEEN OF THE SECOND.*

	No. of epid's examined	Average duration of epidemic influence, in days.	Average Ratio of mortality for each epidemic, to the population, per 1000.	TEMPERATURES IN THE SHADE. GENERAL AVER. AT			TEMPERATURES IN THE SUN. GENERAL AVER. AT			TEMPERATURES of the Dew Point. GENERAL AVER. AT			BAROMETER; GENERAL AVER. AT			WINDS. Predom nt at			HUMIDITY. General avr. at			DRYING POWER. General avr. at		
				Commencement.	Maximum.	Declination.	Commencement.	Maximum.	Declination.	Commencement.	Maximum.	Declination.	Commencement.	Maximum.	Declination.	Com'nc'ment	Maximum.	Declination.	Commencement.	Maximum.	Declination.	Commencement.	Maximum.	Declination.
From Cholera,	6	37. $\frac{66}{100}$	21.99	72.84	66.95	69.73	81.36	84.59	80.31	66.71	56.79	61.14	30.109	30.060	30.075	S E & E	N.E E&c	N & S W	.850	.796	.791	5.06	7.08	7.24
From Yellow Fever,	15	58. $\frac{33}{100}$	18.30	80.14	79.60	65.72	106.91	117.07	99.11	75.82	74.34	62.12	30.108	30.024	30.074	N. NE S E	E. & NE.	NE N & E.	.888	.865	.755	3.79	4.53	8.02
Difference	..	.....	.....	7.30 more.	12.65 more.	4.01 less.	25.55 more.	32.48 more.	18.80 more.	9.11 more.	17.55 more.	6.98 more.	.001 less.	.036 less.	.001 less.	m NE	But l'tle dif.	m NE &E	.038 more	.069 more	.036 less	1.27 less	2.55 less	0.78 more

* The investigation to reach the positions in the Table, have extended as far back as records have existed, reaching from 1817 to 1854, inclusive. During the earlier epidemics, the meteorological materials found have been very scanty, but constantly increasing as we approach the present period. During the nine yellow fever epidemics embracing most of the date in each of the columns of the Table, it is remarkable that, although the results stated are but an *average* of the whole, the *extremes*, or variations from it, in any year, are very small. For instance, that most important one, the *Dew Point*, the *minimum* at which the *epidemic* yellow fever passed off, has required, to destroy that character, has been noted at 58° 26; and the *maximum* in any year, under which it ceased its ravages, was 66° 64, being a difference of a fraction over 8° only; of course, the temperatures in each case was much higher, and the remarkable fact is shown that *no epidemic in that long series has required that the temperature during which it has ceased its ravages* should descend to the *limit of frost*, and that actually the minimum at which any *epidemic* ceased was a small fraction over 60°. This corresponds, so far as we know, with what we find of it in more Southern countries. This refers exclusively to its character as an *epidemic*. It has never been known to have ceased entirely at once. But the cases occurring after the disease has lost this character, must be considered as *endemic* or sporadic and to arise from strong local causes and great personal susceptibility. Time has not been allowed us to extend this investigation fully to a comparison with other places and climates, but it is in active progress and we hope to communicate the results hereafter.

This table shows what an examination of the details of which it is but the concentrated result would more than justify; viz:

1.—What are the several meteorological conditions of yellow fever and cholera at the *commencement*, *maximum intensity and declination* of these two diseases when existing in their *epidemic* grades.

2.—In comparison, it shows that cholera exists in a greater range of temperature and humidity than yellow fever.

3.—That these diversities constitute the pabulum for its support, so far as the mere climatic condition is concerned.

4.—That a higher solar radiation and atmospheric pressure exists during yellow fever periods than during cholera. Although the atmospheric pressure under which these two diseases prevail are shown by this average table to be about the same, the barometer continuing at a permanently higher grade, more regularly and constantly in yellow fever than in cholera, yet in this latter the fluctuations are much greater; indeed, it is so under all its climatic relations, as is abundantly shown in the large detailed table too extensive for this summary, of which this is a very condensed abstract.

5.—That for the existence of yellow fever a higher range of temperature and of dew point for its commencement and maximum intensity, and that a declension of the former (temp.) to less than 70°, and the latter (dew point) to near 60° puts a speedy end to its *epidemic* existence.

6.—That a larger quantity of rain usually falls, on an average, during the existence of yellow fever than during cholera.

7.—The "drying power" is more variable during cholera than during yellow fever.

8.—The average duration of *epidemic* yellow fever has been 58.33 days, and the period of its influence decreasing, while the average duration of *cholera* has been 37.66 days, and the period increasing.

These experiments are fully borne out by what we see daily verified of the ravages of these two very different diseases in the various climates that have been subject to them.

If subsequent observations shall prove the correctness of these statements, the future occurrence and continuance of *epidemic* yellow fever will be ascertained with great probability by referring to a well kept meteorological register; it will show what valuable information is to be derived from connecting accurate and extensive meteorological experiments with the Health Department, recommended in a subsequent report.

There are but two practical remarks which we deem it necessary to draw from this table, and from the reasoning in the reports: the first is, that although it is easier to keep free of yellow fever than of cholera, we can exercise much influence on the causation of both, even in their climatic relations; and secondly, the *combination* of the terrene and meteorological conditions which is *absolutely essential* to the existence of either, we *certainly* have it in our power greatly to control, because, by proper policeing and regard to other hygienic measures, that condition is clearly under our influence.

If then, we have demonstrated, as we trust we have, in the subsequent pages, these important truths, and shown what are the meteorological elements necessary for the existence of EPIDEMIC yellow fever, and even of cholera, and pointed out the conditions in which they decline, its great value will be appreciated, not only by the scientific public, but far beyond this, its importance for the practical purposes of life will be inestimable. The ability to make the announcement that an epidemic exists; and again, that it suspends its ravages, and that all danger is over; in the first case warning the accessible population to speed to a place of safety, and in the second enabling us to invite back the flying citizens to their deserted homes; to open the public thoroughfares to the resumption of business, and the ordinary purposes and pursuits of life, will be of incalculable practical value to the community. This principle is held forth for our guidance throughout our report; nay, it is the basis on which is founded, the object sought—PREVENTION, saving the community from the *infliction of disease.*

We state these as the result of our experience *in this climate*, and let us be understood to mean that by the meteorological elements of these diseases, (consisting of a very high range of temperature and saturation, and great solar radiation,) we intend to express the limits within which they have prevailed here *epidemically*, which are essential to their existence as such, and beyond which they soon cease. Now, whether these views will be borne out elsewhere, we believe there is, as yet, no recorded (certainly no published) statements to show. We are perfectly sensible that climatic conditions and national susceptibilities differ in different countries, and produce often diversified results, and that cholera has prevailed in great apparent diversity of climates, and that the meteorological elements would seem not to apply to it. Statements are recorded of the prevalence of cholera when the EXPOSED thermometer was near zero—this is not at all incompatible with an *inside* temperature of between 70° and 80°, with filth, the peculiarly noxious effect of crowding and most defective ventilation, (and of course, a high dew point,) all of which, we know, exists in Russian dwellings, where this disease prevailed. The incongruity then no longer exists, for it is *the condition to which the individual is exposed that is to be estimated.* Nevertheless, we acknowledge that it will take time, observation and experiment in different climates to show where and what may be the variations, if any, from the views laid down. There is little doubt, however, that if they are not precisely the same elementary or atomic (if we can use the expression) combination, yet the *principle* is the same; to-wit:—a union of meteorological and terrene conditions for the production of either of these epidemics.

The principles set forth in the reports, the facts commented on, the important and necessary combination of meteorological and terrene conditions, the places and sources of infection pointed out in our map, with their constant consequences, have been most impressively and accurately illustrated and corroborated by what has occurred during the present summer, (1854.) Fever has again been *manufactured in* the depots pointed out, (under the combination alledged) the filthy wharves and river banks have again cast their noisome odor to poison the atmosphere, and the additional aid from corrupted bilge water and filthy vessels from abroad, the dirty back yards and unfilled lots and overflowing privies have added their mite, the cleansing out of canals and the disturbance of the streets for laying down water and gas pipes have continued throughout the season, and although the streets have been better attended to than heretofore, they form a very small portion of the necessary policeing of a great city, and the result has been that yellow fever has again swept off its numerous victims and will ever do so until we become wiser by the lessons that have been so often furnished us.

But again, this position has been farther confirmed by what has occurred in other cities during the present year. In the city of *Savannah*, the epidemic of this year is with great probability attributable to the exhumation of a large number of vessels sunk just below the city during the revolutionary war and that of 1812, to the filthy land and other debris derived from the city and the tide, which was thrown upon the bank near the town and even spread upon the streets, over which the wind constantly blew, and to the excavation of the soil of the streets (at least a mile) for the purpose of laying down water pipes.

The epidemic at *Augusta*, was as fairly owing to the cleaning out of filthy canals in the city, and exposure of the offensive mud to the hot summers sun, to the emptying the city filth on the bank of the river, which was unusually low, and to the disturbance of the soil of the city for the purpose of laying down gas pipes.

Since the special reports were written, and even gone to press, some, indeed most of the foreign reports, highly valuable as they all are, have been received through the State Department at Washington, and it is no slight gratification for the Commission to compare their experience and observations in relation to the etiology and contagiousness of yellow fever with their distinguished confreres in other regions of this zone, and to see the remarkable harmony in our views; it furnishes a strong corroboration of the opinions and principles announced, and presents a new claim on public confidence.

For the purpose of carrying out in a full manner the views herein set forth, we earnestly recommend the project of a Health Department in a subjoined report. Such an organization we deem indispensable to the condition and character of the city; special requisites are demanded, with experience, science and skill. It should be constituted a special Consultative Department, to be advised with in all cases by the city government, affecting the health of the city, and it will be seen, hereafter, they are very numerous. No enlightened large city is without one, and here it is more demanded than in any other.

It is recommended to State, city and corporate authorities, that whenever disease of an *epidemic* character exists to an unusual extent or malignancy, that special commissions be instituted to investigate their origin and causes. Such action is in consonance with the philosophic spirit of the age, and we are proud that the first Commission for this great philanthropic purpose, should have the honor of having been originated in New Orleans.

ERRATA.

Page 2, read Condition for Commission, in heading.

" 3, read effluvia for affluvia, in line 11th.

" 4, 14 lines from top for "passee" read *passu*.

" 5, 6 lines from top—on margin, for "postolata" read *probata*.

" 5, 13 lines from bottom for "reasonably" read *seasonably*.

" 6, 17 lines from bottom for "members" read *numbers*.

" 12. 6 lines from top—insert *not* between "I" and "think."

" 23, in 4th line from bottom for "thermometer" read *barometer*.

" 25, 11 lines from top—attach note after 50 3' "on the 23d after epidemic had declined," and at the very period marked for its declination, evidently producing it."

" 25, 17th line from bottom, for hygrometic read "hygrometric."

91, 5 lines from bottom for "productions" read *production*.

106, in note at bottom for "same" read *I am*.

" 107, 18 lines from bottom after "offensive" insert "and the cutting down the bank of the river, and spreading the materials on the streets."

Page 109, 9 lines from top for "causing" read *producing*.

" 182, 16 lines from bottom for "lethal" read *lethalè*.

" 200, 19 lines from bottom for "nature" read *influence*.

" 200, 2 lines from bottom for "fellow" read *fever*.

" 207, 15 lines from top for "renewal" read *removal*.

" 211, 12 lines from top after "amount," insert *of moisture*.

" 221, 4 lines from bottom for "secured" read *sewered*

" 228, line at top for "gradual" read *gradually*.

" 239, in 8th line from top for "monaxysinal" read *monoxysmal*.

" 241, in 7th line from top after "fifty" insert of.

" 241, omit two lines beginning at "16th," 13th line from bottom.

" 247, in 2d line from top for "men" read *even*

" 247, 14 lines from bottom for "200,000" read 2,000,000

" 248, in 11th line from top for "on the" read *as a*.

" 249, in 9th line from top after "burthens" insert *respectively*

For table "H," read table G.

ADDITION TO ERRATA.

Page 79, first line, top—for "*succession*" read accession.

169, 11 lines from top—"*distinguish*" read distinguishes.

205, 15th line from top—put a period after moisture, and a capital "P" to "*probably*," next word.

220, 14 lines from bottom—for "*ills*" insert benefits.

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TO

CHARTS, TABLES, MAP, &c.

The following table was prepared for the purpose of aiding to fill up the three first columns in the table in the Introduction, so as to extend the averages over as large a number of epidemics as possible, with no intention whatever of publishing it. It is furnished now at the unanimous request of the Sanitary Commission, as embracing important views of our comparative condition but little known, and upon which most erroneous opinions are entertained.

The climatology of the year has also been most carefully compared with that of the preceding epidemic years and found entirely to correspond. It has also been comprehended with the averages in the other columns, and adds its important mite in their verification.

This table farther shows, that with the exception of the remarkable year 1853, produced by the most unusual concurrence of causes—that it is *certainly* in our power to say shall never occur again—that the yellow fever *is not increasing* among us; that the present year stands in comparison with others but as the tenth, and still does not forbid us to entertertain the sanguine hope, expressed elsewhere, that if the suggestions as to its prevention are fully carried out, we may be enabled to drive it entirely from among us.

Since the "Report on the sanitary condition of New Orleans" was put to press, important corroboration of its views in relation to the causes of our epidemics has been obtained—besides those mentioned in our "Introduction," in relation to this year. If necessary, they can be comprehended in a supplemental report—wherein, with other documents intended for our report, but necessarily excluded—I propose to state the meteorological elements of epidemic yellow fever in other climates and places, in corroboration and illustration of what has been found here.

E. H. B.

COMPARATIVE TABLE.

Estimate of the Salubrity of New Orleans, as affected by her Epidemics.

1st—of Yellow Fever.

YEAR.	Total mortality.	Mortality from yellow fever.	Total population, (actual and calculated.)	Milesemal. Ratio of total deaths to total population.	Milesemal. Ratio of total of yellow fever to total population.	Relative mortality of each epidemic.
1817	1,772	600	24,196	73.22	24.79	3d.
1819	2,138	425	26,183	81.65	16.23	9th.
1820	1,766	400	27,176	64.98	14.71	11th.
1822	2,734	808	31,706	86.86	25.48	2d.
1829	2,520	900	47,561	52.98	18.92	6th.
1832	8,099	400	55,084	147.02	7.26	14th.
1833	4,976	1,000	57,713	86.21	17.70	7th.
1837	4,807	1,300	68,229	70.45	19.05	5th.
1839	3,934	800	73,487	53.53	10.88	12th.
1841	4,549*	1,325	78,745	57.16	16.82	8th.
1847	9,043	2,318	108,609	83.11	21.34	4th.
1848	8,026	872	115,503	69.48	7.54	13th.
1849	9,862	769	122,511	80.49	6.27	15th.
1853	15,787	8,101	154,132	102.42	52.55	1st.
1854	10,564†	2,484	160,823	65.69	15.44	10th.
Totals,	80,577	21,624	......	......	......	....
Averages,	5,371	1,441.60‡	76,777	73.30	18.30	....

The same as affected, 2dly, by Epidemic Cholera.

		From Cholera				
1832	8,099	4,340	55,084	141.02	78.78	1st.
1833	4,976	1,000	57,713	86.21	17.32	3d.
1848–'9 (of '48)	8,026	924	115,503	69.48	7.99	4th.
1849	9,862	2,081	122,511	8.049	16.98	2d.
1852	8,670	1,080	147,441	58.80	7.32	5th.
1853	15,787	554	154,132	102.42	3.59	6th.
Totals,	55,420	9,979	......	......	......	....
Averages,	9,236	1,666.16‖	......	89.73	21.99	....

To complete this table to the present period, and render it more satisfactory, it was necessary to *estimate* many of the past months, as well as some *future returns* for 1854; for, there being no authorized Board of Health, or of record, to enforce returns from the cemeteries, several have reported in the early part of the year irregularly, and sometimes omitted it altogether. I have been able to procure a reliable return for January; for parts only of February, March, April, and May, and have had to estimate the balance; for the rest of the year to the 18th of November, the *returns* are about the same as usual. That in relation to yellow fever is, no doubt, as reliable as at other times. The balance of the year has been estimated.

* Including Lafayette hereafter. † Partly estimated ‡ The mortality from *yellow fever* in *epidemic* years, thus forms 26.84 per cent. of the whole mortality. ‖ The mortality from cholera in *epidemic* years, thus forms 18.03 per cent. of the whole mortality.

REPORT

UPON THE

SANITARY CONDITION

OF

NEW ORLEANS,

BY

EDWARD H. BARTON, A. M., M. D.

SECTION I.

SYNOPSIS OF ITS CONTENTS.

Preliminary remarks—General programme of grounds assumed and positions to be proved:—The Science of Hygiene—Ignorance of the Truth and assumptions of Facts, leading sources of error, as to our past and existing condition—Filth and Disease—Their relations to one another—The effects of imputed perennial insalubrity upon the thrift and growth of a city—What the healthy and natural standard of mortality of the Rural Districts of a country is—What the like standard in the Urban Districts. Sites of cities never selected wholly on account of salubrity—Sanitary measures and their results in this country and elsewhere—The sine qua non of their efficacy everywhere, must be skill in devising them—seasonableness in applying them, and promptitude and perseverance in enforcing them, &c. &c.

The Sanitary Commission at an early day after its organization, deemed it advisable to assign to each of the members, severally, one of the prominent topics, into which the subject (with which it was charged specially by the city authorities) naturally and conveniently divided itself. To my share was Division of duties.

allotted the special and arduous duty, of making "A THOROUGH EXAMINATION INTO THE SANITARY CONDITION OF NEW ORLEANS, AND OF ALL AGENTS AND CAUSES INFLUENCING IT DURING THE PRESENT AND PREVIOUS YEARS, AND TO SUGGEST WHATEVER IN OUR WISDOM WILL TEND TO IMPROVE AND PRESERVE THE HEALTH OF THIS METROPOLIS." This opens a vast field of research, with corresponding responsibility, and on a theatre where the making and preservation of records are the last things to be thought of; however, those archives, the fruit of the garnering and toils of years here, will now show their value, as well as foresight, in collecting them, and it only remains to set forth for public consideration and judgment—the facts—reasonings and conclusions, which have resulted from our investigations; and which I proceed now to do.

REPORT.

That this particular and voluminous branch of the subject, as well as those branches of it, devolving upon my learned associates, is full of importance to our immediate constituency, and eventually may become so to the age we live in, we confidingly believe, because we are fully hopeful of the results which must follow the adoption of the preventives and remedials we have suggested, at the close of our labors. But, will the city authorities, adopt and carry out, such as we have suggested and advised? That is more than we can say: But, this we *know:* That if the causes we have assigned for the late devastating pestilence, as well as those which have preceded it in past years, be clearly and inevitably deducible from the facts we have presented, and are truly assigned;—then must it follow as does night the day, that the preventives and remedials we have recommended, if seasonably applied and rigidly enforced,—will not only forestall and *prevent yellow fever* from *originating* here, but from *propagating* here, should it be brought from abroad.

Importance of the subject.

Causes of fever assignable

Let me be understood. I do not pretend to say that *all* the causes, to which we assign the production of yellow fever, can be forestalled in their coming, or expelled when they do come, by any human agency, whatever; for, the meteorological conditions of elevated temperature, excessive saturation, great solar radiation, large precepitation and prevalence of particular winds, or the absence of all winds, may not be entirely preventable or remediable, by the art or the power of man. But, (as will be seen, throughout the report,) great as is the influence we attribute to the presence of these most deleterious and alarming agencies, we have no where attributed, nor wish to attribute, to these agencies *alone*, a capacity for originating or propagating that disease. It is only when they are in *combination* with those morbific influences, which we have denominated *terrene*, (which embrace every species of noxious affluvia, which filth of every description, and disturbances of the original soil, generates and transmits,) that the etiological conditions exist, for the production and spread of the pestilence. Moreover, it is a doctrine of the Report, as it is a corollary from the premises—that the terrene condition *alone*, is without the power to originate the disease, in the absence of the meteorological conditions referred to:—otherwise our goodly city would be apt to furnish the *pabulum* for the disease, not only for the summer and fall months, but expose us to the pestilence throughout the year!

Not atmospheric alone.

Not filth alone

Now, it is a further doctrine of the Report, that these *terrene* causes or conditions, are entirely, and always, within the reach and control of man, and remediable and removable, therefore, at mans' option and pleasure. The *terrene* causes then of great filth, &c., being removed and extinct, the meteorological would be powerless to *originate* the disease here, and if imported here, it would be quite as powerless for propagation, be the meteorological conditions even as ominous and menacing as they were during the late epidemic, and whatever might be their injurious influences upon diseases not needing, for their existence or duration, the presence or potency of the *terrene* conditions; although, most assuredly, we think, that the meteorological conditions never have reached, and never can reach, any thing like the insalubrious and blighting excesses of the past year, in *the absence of the terrene conditions*, whatever

These controlable.

Neither alone sufficient

may be the affiliation or sources of causation and dependance between them.

These remarks are most fully borne out by a brief reference (in advance of what will be more particularly detailed hereafter,) to circumstances attendant upon the largest mortality, the subsidence and cessation of the late epidemic. The subsidence was gradual, it was true. It always is so. But it was marked, and full of significance.

The remarkable culminating points of each.

Solar radiation reached its loftiest elevation on the 19th of August; the epidemic reached its culminating point on the 22d; down, but gradually, subsided the combination of high temperature and great humidity, and although the latter, was occasionally very high afterwards, the *combination* of high temperature was wanting to give it virulence; the epidemic, also, gradually declined, pari passee, with these important changes in the atmospheric element, which hung over our doomed city like a funeral pall, and as they gradually passed away, the refreshing blasts returned, until the health point (the equilibrium) was reached, and the

Frost.

epidemic had ceased, weeks before the great queller, (as is thought,) *frost*, made its appearance, and fully one month earlier than all prior epidemics. The chart B, and tables D, and E, accompanying this Report, are absolutely conclusive of all this.

Well, in all this time, and up to the final cessation and disappearance of the epidemic, what became of the *terrene* condition. *They remained wholly and absolutely unchanged!* Indeed, all knew (or *seemed* to know) that it would have been madness to have *disturbed* them, while the fever lasted, and of course, they were let alone, or not materially altered, (except the cleaning of the streets, which is a very small part of the

Combination only fatal.

cleaning of a city—probably not constituting a *twentieth* portion .) What better proof could one have than this of the total seperability of the two conditions? And what better proof could there be that as the separation progresses, the disease subsides, and that when the seperation was complete the disease was extinct! And what can follow—BUT THAT IF

THE COMBINATION HAD BEEN PREVENTED, SO WOULD HAVE BEEN THE DISEASE!

To sum up—the leading and controling principle that has guided us in all our sanitary conclusions is that the following *postulata* have reached the importance of demonstrated truths, through the facts and reasonings set forth in the Report, viz:

1st. That a close junction and combination of the meteorological and terrene conditions (referred to) is absolutely indispensable to the origination, transmission and duration of yellow fever every where.

2d. That all the terrene conditions referred to, are controlable and removable by human agency; and consequently, are seperable from the meteorological conditions, at man's option, and at man's pleasure. **Postulata.**

3d. That the atmospherical element can be much modified and ameliorated by man's influence.

4th. That the irresistible corollary from the *probata* are, that yellow fever is an evil, remediable and extinguishable by human agency. **Corollary.**

The great practical principle of the Report, therefore is, that the yellow fever, although among the greatest of physical evils, is demonstrably, a remediable evil, and it will be the function of a future section to set forth, in detail, the remediable appliances, which reasonably employed and scrupulously enforced, will, I feel confident, extirpate that disease in any locality. **Yellow fever preventable.**

All this we maintain confidently and boldly, for our conclusions have been neither overstrained nor far-fetched, but are the legitimate progeny from the relations subsisting between cause and effect. If others may disallow or distrust them, most assuredly the Commission could not. How could we, when we know, that in the fullness and accuracy of the facts we have gathered, no toils have been spared; that in collating them one with another and assigning the appropriate weight to each, every care has been taken, with searching and impartial scrutinies for our guidance, to commit no mistake, and as to the facts and analogies we have brought from afar, we have presented the most **Duty, responsibility, and toil of the commission.**

eminent and reliable medical authorities of the living and the dead, as our vouchers for the facts they have recorded and the deductions they warrant, when applied either to them or to our own special testimonies. It is these deductions which constitute and authorize the results we have proclaimed; and these results constitute the bases of the principles we have promulged and maintain in relation to the origin and causes of and the preventives and remedies for the extirpation and extinction of yellow fever.

Fair examination and immediate trial.

Looking then, to the momentous interest we represent in this first great sanitary movement in the South—inviting the utmost scrutiny into our facts, principles, authorities, and the corollaries we have deduced—we only expect that confidence to which, we humbly deem, all are fairly entitled. If, upon such investigation, the recommendations are found reasonable; if they are in accordance with the science and the well attested experience of the present enlightened age; then we hope there will be no hesitation in putting them upon immediate trial. The "let-alone system" has been tried long enough; it has filled and darkened with a deeper gloom the domicils of the dead—cast adrift members of our cherished population—restrained and still restrains large and valuable accessions, and has checked and impaired our advancement and thrift in every branch of industry. The trial has been full and *unsatisfactory.* ALL unite in saying there must be *sanitary reform*; it is written in indelible characters on the age.

Laws of health established a mark of civilization

Health is the greatest of earthly blessings; the rules applicable to it are reduced to a science; it is denominated *Hygiene*; it is governed by principles and regulated by laws, almost as precise and exact as those attached to any other department of science. It is the true science of life; it teaches men how to live, and how to prolong life, and when properly applied, it has increased its average duration for terms averaging from ten to twenty years, and surely, this is worth striving for. It is now fully understood, and the most enlightened communities and nations are adopting its principles, and applying them to practice. In our country it has diffused its blessings in proportion to the extent of its application. The adoption of its principles, as well general as personal, is a mark of civilization, and characteristic of refinement. Indeed, sanitary reform is the talismanic *indicium* and distinguishing amelioration of modern reformation.

No ills without a remedy.

From the afflictive dispensation with which it has pleased an all-wise Providence to visit our city during the last summer and autumn, it becomes us to draw lessons as well of wariness as of humility. There are no physical ills inflicted upon man without their uses and their recompense. If the mortuary calamities of the year will drive our people (so long deluded on the subject of their sanitary condition) to open their eyes to the actual truth; if it can be demonstrated, to their satisfaction, that we have labored and suffered under *remediable ills;* that there is yet hope for us, then the fearful lesson we have been taught will not have been in vain, and we shall be able to date from 1853 a new era of prosperity and progress, in all that may be compassed through numbers and commerce—health and thrift.

Value of the lesson.

New Orleans requires sanitary reform, more than any other city.

In no part of the world is a thorough sanitary reform so much needed as in New Orleans. In no country on earth has a place been so much injured through a want of insight into her sanitary condition by her municipal officials. In none have more pains been taken to keep from the people a knowledge of it; the very attempt to enlighten the public in relation to this important interest has been steadily repulsed with denial, if not with incredulity, and the authors have been pointed to as inimical to the city! The obvious effect of all this has been the almost entire neglect of sanitary measures. There is another party who ascribe all the ills said to affect us to a *foreign* source; and again, there is another who despair of the power of man to alter our condition. This fixed incredulity as to the existence of facts on the one hand, and of the exotic sources of importation of the malady on the other, with an utter inadequacy of means of preventing its introduction, or expelling it when it came, is plainly

Risk in speaking the truth.

Causes of our neglect and apathy.

the cause of our apathy at the results, and restraint upon all trials at amelioration. Either opinion is adverse to a change, and from the statu quo in which the city has been kept for so many years, it might be supposed these were the prevalent opinions. They may be all resolvable into an ignorance of our actual condition—of what has produced it, and of those vast influences that have effected the wonderful changes in the sanitary condition of cities all over the globe. A belief in them has heretofore been a barrier to all improvement, has palsied the hand of enterprise, and has driven from our city valuable citizens, and prevented the immigration of labor, of wealth, and of intellect. That these views are sincere there is no doubt; that they are erroneous I trust to *demonstrate* in the course of this investigation; that they are entirely un-American, so entirely opposed as they are to the progressive advancement of the age we live in—so outrageously at variance with what has been clearly demonstrated as the result of the application of sanitary laws and usages elsewhere, I think there is no doubt. I trust to show that they will not bear the touchstone of examination, and that it is the highest aim of patriotism to make an attempt to alter them.

Ignorance of our condition.

Highest proof of patriotism.

New Orleans is one of the dirtiest, and with other conjoint causes, is consequently the sickliest city in the Union, and scarcely anything has been done to remedy it. That the one results from the other, is in exact accordance with the *common sense*, the *common experience* and *common feelings of mankind*, and yet, to use the language of a distinguished investigator, "the city lies quiet, with an open keg of powder with a lighted torch only a foot above it." Like causes produce like effects, under the same circumstances, forever. If then, the city is to be restored to salubrity, there must be a *radical change*. It is the duty of medical men, who, from their studies and province, ought to know the value of sanitary measures, to urge upon the community their great importance, to show the critical condition on which rests the foundation of public prosperity; and if any change is to be wrought, "it is best to be done quickly."

Filth and disease, cause and effect.

No city can bear many inflictions of such a calamity as that of last year without serious deterioration. Concealment and boasting will not help us much. Public confidence is plainly on the wane; the disparaging truth that almost every official as well as unofficial means have been used to conceal, deny, explain away, has been resorted to, and now it stands forth in all its unabashed effrontery, in the very face of well attested and repeated proofs afforded by our Board of Health and our Medical Faculty, that the evil exists, and is remediable.

When, a couple of years ago, an enterprising fellow-citizen (James Robb, Esq.) informed the public that "he would sink or swim with New Orleans," in a great railroad scheme, that was deemed essential to our prosperity, little did he—little did the general public think that anything else was wanting to insure that prosperity but *railroads!* so successful had been the assertion that "New Orleans was one of the healthiest cities in America," in spite of the most unequivocal proofs before the public to the contrary, evincing a self-love, that a public, gullible always, upon that point, is so prone to swallow.

Proof of our gullibility.

It required a great calamity, like that of 1853, to open our eyes to the actual truth. A conviction of an error must precede its correction. A knowledge of causation must precede the application of the means of prevention. On the important subject influencing the health of the community, "ignorance is not bliss." The cost to our city, to reach this conviction is to be estimated by millions, and to her commercial prosperity—to the value of her real estate—to the reputation for perennial insalubrity—figures cannot calculate it. But how shall we estimate it in the orphanage—the widowhood—the loss in valuable citizens—in the products of labor! Shall we say then, that all this *could have been prevented?* Have any preventive means been tried? Have there been any organized sanitary measures? Is not all the world benefited by them? Does not the common sense and common experience of mankind here coincide? Are we to take advantage of what this teaches us, or are we to be an exception to the balance of the world? Does here flourish

Value of knowing the truth.

Cost of ignorance.

No attempt to alter it.

The real mortality for half a century.

perennial health, and have we found out the perpetual elixir? The record in chart A contains what has been the memoria, the terrible memoria of the past, and it belongs to the present people to say what that record shall exhibit in future. I invite attention to this chart now merely to show what has been the mortality of the city for half a century, (I shall direct attention to it hereafter for other purposes.) There may be errors in it, but where records of the past are so difficult to be obtained as they are here, it was impossible to do better.

Average mortality for half a century.

This record then exhibits an annual average mortality during that long period, including the disastrous year 1853, 59.63 per 1,000 of the population—*more than double* what it would doubtless have been, had proper sanitary measures been adopted and efficiently enforced at an early period. To what this large mortality is to be properly ascribed, will be pointed out in its proper place, and we shall then see if our situation will admit of corrective measures or not.

The true wealth of a city.

The wealth of a city depends mainly upon the number of its inhabitants—labor is wealth—population and labor are its most productive elements;—a system of measures that is irrespective of the *poor*,—of the immigrant,—of that class that has raised this city from the *swamp and made it what it is*:—that has cleared the land and drained it,—made the streets—constructed the dwellings, and done so much to develop its destiny, is void of justice to the laborers who are worthy of their hire, and is a reflection upon the proprietors who profit by it. The value of real estate rises with competition where there is no overplus in market—the quantity of merchandise sold, depends upon the number of consumers and purchasers. If there is increased risk and jeopardy of life, an enhanced price is put upon every article sold. High food, (when we ought to have the cheapest market in America)—clothing—merchandise of every description,—high rents,—low real estate,—high wages for mechanical labor of all kinds—high price for professional talent;—these are the real reasons, as I am informed by intelligent merchants at *home and abroad*, why we have the dearest market

The real cause of the high price of everything.

in the United States; for comparatively few will risk their lives or trust their capital, *without additional compensation*, for the additional risk run! Hence the inevitable result, a retardation, if not a blasting check upon commercial prosperity and advancement, and finally, a recklessness of life, and corruption of public and private morals. Disease and crime have a similar paternity. They are twin sisters; as exists the one so flourishes the other, and there is not a doubt in my mind, that the most *effective means of advancing the cause of morals and religion among us, would be the establishment of sanitary measures!* "Cleanliness is next to godliness."

Insalubrity and immorality have a similar paternity.

It is assumed by statisticians after a very thorough examination into the subject, that a mortality of two per cent. or one in fifty, may be fixed upon as a healthy and natural standard of mortality. Attached to the late census returns for 1850, the average mortality for the Eastern District of Louisiana was 20.68 in a 1,000, and in the Western District 21.25 to 1,000, and the average of the entire State 20.92. This was a large average for Louisiana, admitting the correctness of the returns —for 25 per cent. of the mortality of that year was ascribed to an exotic to our climate (Asiatic Cholera.) The whole of England averages 21.80, one of the healthiest countries in the world. Throughout the United States the average is 22.47. The average age of death in England is 29 years, while in America it is but 20. The annual average mortality of the six or eight principal American cities, is a little upwards of $2\frac{1}{2}$ per cent. In the three principal cities of England, it is something more. Is it possible then that $5\frac{96}{100}$ per cent., and for the last six years in this city *preceding* '53, it has averaged $6\frac{3}{4}$ per cent.! and this from official *published* sources, is the natural mortality? Is it possible, I say, that this is a *necessary and inevitable* state of mortality? Will the worst enemy of New Orleans allege for a moment that this cannot be remedied? Is our local position—climate—are the pursuits, character and habits of our people so utterly irreconcilable, or unamenable to all sanitary influences, that this enormous mor-

Average mortality of the State.

Of England.

Of the United States.

Stigma of insalubrity.

tality is to continue, and that we are to bear the stigma of being not only the sickliest city in the United States, but in America,—nay, even in the civilized world? It is not only a stain upon the climate and position—but upon the character of the population, and the generally admitted influence of intelligence every where. Did I think so—I should not pen theselines.

Sites of cities not selected on account of their salubrity.

The primary object in the location of sites for cities, has never been, as it should be,—for the enjoyment of health,—the leading idea has always been,—its convenience for commerce,—business, or political purposes. The consequence has almost always been a great penalty in the sacrifice of life, to subserve these subsidiary purposes; and the most expensive means have been resorted to, to correct it, and usually with success. These remarks apply in a remarkable manner to our city—robbed from the swamps—with large bodies of water all around us—a hot climate—a rich earth teeming with organic remains, we have aggregated together *precisely the materials* with only the addition of a large and crowded population, for boundless insalubrity, although second to no city in the world for commercial purposes, that this result should ensue is not only not astonishing—but it would be the operation of a constant miracle were it otherwise, we have synthetically the very materials for its theoretical existence. Under such circumstances, what does common sense dictate? The answer at once will be—correct it—do, as all other cities have done and not lie idle and indolent, resting satisfied in boasting that it was one of the "healthiest places" in *former times* (when there was *no city* at all!)—but put your shoulders to the wheel, rectify the disadvantages of your position in this respect, and take courage in viewing the stupendous works that have been made to improve the sanitary condition of ancient cities—that yet in their mighty relics, are still standing monuments of the great value those people placed on health, and their confidence in sanitary measures to preserve it. It has been said on high authority,* that the climate of Petersburg, in Virginia, during

Bad locality of New Orleans, if not improved.

* Dr. Jackson.

our revolutionary war, was so fatal that no native of the place survived his 20th year. It is now a healthy locality. It has been more recently known that at Bristol in Penn., so great has been the mortality from the influence of neighboring swamps, that from its first settlement, not above two or three children, born there, have arrived at maturity—and this continued until the swamps were drained. Wilmington, Norfolk, Savannah and Louisville, were annual sufferers under the most disastrous fevers, an investigation into and a removal of the causes have restored them to salubrity. The same remark applies to all the northern cities—Philadelphia particularly, (as will be shown by-and-bye) has suffered as much by yellow fever as New Orleans—nay it has been more fatal there, than here, (*even including our last sad year.*) Now she suffers only an occasional out-break, when her sanitary measures have been neglected. The recent occurrence will be found hereafter only a confirmation of this remark. The same remarks are applicable to Baltimore, New York and Boston; they each of them for the time being have had their filthy or infected localities, when their sanitary measures were not properly enforced; but all intelligent practical men among them admit, that the great improvement in their public health, and particularly their freedom from yellow fever, is owing mainly to the strictness of their police regulations. What insurmountable obstacle exists in the position of New Orleans, that prevents her being benefited by the same means?

Petersburg once very fatal; extent; and do. of Bristol; but corrected.

And do. of others.

On what depends the improved health of the Northern cities.

Much light can be thrown on this subject, by reference to the history of other nations (of the old world) as to what has been effected by sanitary measures. In their true interpretation they are but the application of the arts, purposes, comforts and science of civilization to the promotion of health. That this has been extended in proportion to the attention paid to them and that when this has been withdrawn and a relapse into comparative barbarism has resulted, the mortality has increased. It should be gratifying to the pride as it is flattering to the industry and intellect of man, that through their constant efforts only, the salubrity of any spot (not salubrious from position) is main-

Experience abroad.

Man's situation dependent on his industry and intelligence.

tained; when these are relaxed, or when prosperity and civilization decline, the seed of disease, are, as it were, immediately deposited in the earth. There is scarcely a civilized nation of any note mentioned in history, whose progress and decline are not illustrative of this truth. In the flourishing condition of empires, disease has been kept at bay—industry and cultivation has kept pace with population, the arts and sciences have flourished, and man has fulfilled the great end of his being. With the decay of the arts and enervation of a people, cultivation has been abandoned—negligence has supplied the place of industry, and the mouldering columns and dilapidated palaces are the sure forerunners of the pestilence that sweeps its desolating besom over the land, and finishes that which man has commenced. The sombre aspect of the Ottoman Empire, and the flourishing condition of Great Britain, furnish impressive pictures of the truth of these remarks—the former being in the most neglected and sickly state—the latter the best cultivated and healthiest country in Europe. It is thus that fate, foredoomed by negligence and ignorance of invariable physical and moral laws, advances to destroy the cherished pride of many ages. Rome once the queen of cities, is following the fate of Babylon, and from the same cause, is daily diminishing in population. Pestilence advances from street to street, and has already become the sole tenant of some of its finest palaces, temples and churches. Rome, indeed, might be singled out, as affording in itself and as a warning to us, a history of most that is interesting in the police of health. When still the capital of the world, in spite of her liabilities, she overflowed with population, and the disadvantages of her position were counteracted by the activity and moral excitement of her inhabitants, the drainage of marshes, the width and durability of her paved streets and the abundant supply of pure water, from her numerous acqueducts for baths and other domestic purposes.* England, in the 17th century, was desolated by a constant

As shown in England and Turkey, contrasted, and with other countries.

* From an Introductory Lecture, by the author, to his class in the Medical College of Louisiana, December, 1835.

repetition of plagues, they have disappeared under the ameliorating influence of sanitary measures. Such too has been the case in the greater part of Europe ravaged by repeated plagues of leprosy. In several portions of it, the average duration of life, up to the present period, has nearly doubled from the same cause. But a stronger case is presented in Egypt, a country in so many respects similar to our own;—in latitude, climate, and liability to inundation from the great rivers. The plague, (which is in that country what the yellow fever is in this) exists in a sporadic form, every year, and the epidemic form about every two years and where during a recent outbreak (1835) it was fatal to upwards of 38 per cent. of its *inhabitants!*—nay, I may say *natives*, consisting of Negroes, Malays and Arabs, a description of the filthy, crowded, unaired, holes (hardly houses) they live in—the stagnant water and garbage around and a deprivation of every comfort, will readily account for this enormous mortality. An accurate examination into the condition of the classes and circumstances of the various races upon which this carnage fell demonstrated, most clearly, that it existed in exact proportion to the neglect of sanitary measures. It was least among those Europeans, who lived in airy well ventilated houses and severest on those who dwelt in the most crowded and filthy manner. A reference to the history of the same unfortunate country, a successive prey to almost every invader for centuries, will exhibit infliction or suspension of the plague just as proper measures have been adopted or neglected to preserve the health of the people; health, like liberty, requiring eternal vigilance. "During the reign of the last of the Pharaohs, during the 194 years of the occupation of Egypt by the Persians—the 301 during the dominion of Alexander—the dynasty of the Ptolemies and a great portion of that of Rome, EGYPT WAS FREE FROM PLAGUE!* The absence of any epidemic, for this long space of time, was entirely owing to a good administration of government and sanitary police, conquering the *producing causes*

Condition of Egypt.

Mortality with the natives.

Salutary effect of sanitary measures.

* Report of the general Board of Health, of England.

Consequence of their neglect.

of this most formidable malady, in a climate very similar to our own.* The fatalism of Turkish administration, opposes a barrier to all improvement and one of the finest climates in the world, is left a prey to controlable calamities. The sanitary history of Rome affords us a hardly less valuable lesson. The position is a sickly one—and the average mortality even among her highest class was at one period as high as 5 per cent. To correct this she has left some of the noblest monuments which the hand of time could not entirely destroy—in her vast underground drainage and sewerage, with her neighboring marshes dried, and other sanitary measures. With a neglect of these in her successive revolutions of government—disease again became ascendant, and one of the oldest and most lovely countries in Europe, at certain seasons, is scarcely habitable. The examples might be greatly extended, to show, that by the effect of sanitary measures and extending the comforts of life throughout all classes, and these are but sanitary measures, the average duration of life has been in many instances doubled, and in all, greatly extended.

Awakening of the public mind to the value and importance of sanitary reform.

One word more, preliminary to proceeding in *medias res:* The appointment of the Sanitary Commission has resulted from a conviction on the part of the public that the sanitary condition of the city demanded the most serious investigation; that there had evidently been vast errors in the public mind in relation to it; and, apart from all that *might have been* the condition *of New Orleans at an antecedent period,* and which can be readily credited from what we know of the rural districts now, still common sense required us to look it full in the face at *what it is at this time.* The subject itself is not a difficult one. The difficulty alone subsists in reconciling conflicting opinions. It exists in dispelling the cloud of errors that conceal the truth. It exists in getting men to belive what is against their (apparent) interest, rather than

Where lies the difficulty.

* Among these was specially noted was the neglect in *draining the marshes* after the *inundation*—leaving so many stagnant pools to exhale their poisons to the atmosphere. This was rigidly enforced during the Pharaonic and Ptolemaic times. GLIDDON

anything intrinsic in itself; here it is all clear enough, it only requires the plainest reasoning from effects to causes, and *vice versa*, it only has to show what has been done a thousand times before, with *but one uniform result!* It is not the object or intention of the Commission to flatter themselves, the people or the place; our object is to deal with *facts*, not to form hypotheses; to show, if we can, if our situation is a remediable one; if from the apposition of the facts, theoretical views shall be entertained or result, we plead beforehand, avoidance of speculative intentions, and trust that the facts themselves will be estimated at their sole value, no more. We earnestly entreat a patient and unprejudiced hearing.

Not in the subject, but in prejudices and ignorance of it.

SECTION II.

Medical Constitution—what of each month—influence of meteorological conditions upon mortality—Prediction of the epidemic in May—its commencement—interpretation of physical phenomena—peculiar climatic conditions—when they ceased, and the epidemic—the cholera epidemic of November and December, parallel between cholera and yellow fever weather and liabilities, and differences—climatic peculiarities of the year—peculiarities of the epidemic influence on man.

MEDICAL CONSTITUTION.

The Medical Constitution is derived from such a combination of climatic and terrestrial conditions as influence the constitution of man. What that constitution has consisted in (in the present case)—we shall show in another section,—constituting the most remarkable year, known in our annals. We propose now to consider, briefly, what has been the meteorological condition and its special influence on the salubrity of the city (of course in connexion with the other condition) in a succinct summary for each month.

Medical constitution.

What.

During the month of January 1853—the maximum temperature was 71—the minimum $33\frac{1}{2}$—the average 47 and the

Do. of Jannary.

range 37½—the average dew point was 44.93—barometric average 30.113—average humidity .882. The highest solar radiation 47° (a most remarkable difference between the sun and shade for the month of January.) Amount of rain 3.190 inches; winds mostly from the North, and weather pleasant.

The mortality amounted to 679. The largest number being from consumption and amounting to 92, and a very uncommon feature was the occurrence of two cases of yellow fever. The whole zymotic class amounted to 133.

Do. of February. During *February* the maximum of the thermometer was 77—minimum 36½, average 56 and range 40.50—the average dew point 50.48—average of the barometor 30.238—average humidity .845—average amount of vapor to each cubic foot 4.579—the highest solar radiation 37—winds very variable—and more from the South and Southeast, with increase of force—amount of rain 4.600 inches. The amount of the mortality was 441; of consumption 83, of the zymotic class 65—another case of yellow fever being returned.

Of March. During *March*, maximum of the thermometer was 78, minimum 43, average 62.63, and range 35—the average dew point 56.17—average of the barometer 30.262—average humidity .832—average amount of vapor in each cubic foot 5.381, the highest solar radiation 40— winds mostly North, and amount of rain 6.870 inches. The amount of mortality was 463; of consumption 90, of the zymotic class 54—of pernicious fever 2—of scarlet fever 14.

Of April. During *April*, maximum of the thermometer was 85—the minimum 50, the average 70.37 and range 35—the average dew point 66.60—average of the barometer 30.260—average humidity .833—average amount of vapor in each cubic foot 6.804—the highest solar radiation 29—winds mostly from the South, and amount of rain 1.848 inches. The mortality was 532; consumption still being the largest and amounting to 80—the zymotic class being 89—scarlet fever 19—measles 20—pernicious fever 5—and diseases of the nervous system 75—a very large increase over any preceding month, more than double that of March, and first showing the impress of what was to come.

During *May*, the maximum of the thermometer was 88—the minimum 60—the average 73.82, range 28—the average dew point 67.11—average of the barometer 30.237—average humidity .842—average amount of moisture in a cubic foot 7.601—the highest solar radiation 39—winds Southerly and Easterly, amount of rain 3.840—a largely increased combination of injurious influences. The moisture had greatly increased with the high range of temperature, although the precipitation had been small, below the average of the month—as the preceding had been, eminently showing how erroneous it is to calculate the amount of moisture from the quantity of rain that falls, and the cause of the mistake that some of the communicants to the Commission have fallen into in describing the condition precedent and accompanying the existence of the epidemic, while on the same page, a few lines off, the evidences and effects of *this moisture* are pointed out—in the extensive prevalence of mould; and a vegetable life that alone predominates in very humid weather, and the existence of a stagnant atmosphere, or such winds as are known to be solvent of a large amount of moisture.

Of May.

Moisture mistaken for dryness.

The high combination then of heat and moisture, with so small a precipitation, together with a most remarkable elevation of solar radiation, greater than I had ever seen it, so early even as January, (see chart,) assured me that the climatic influences were very remarkable, and when I saw the filthy condition in which the city was—the great extent of exposure of the original soil of the city—for gas, water, and other purposes, the digging of the Carondelet Basin, the cleaning out of canals, and the embankments and excavations for railroad purposes, and the reflection on the fatal consequences that these had heretofore always brought on our city, with the chart A before me; this early connection of the atmospheric element with the physical showed, in the combination, a foreshadow of what was to come, and enabled me to give

Grounds for the prediction of the epidemic in May.

a warning as early as the middle of May, in the Academy of Sciences, in this city, of the disastrous consequences that were to follow, and to some scientific correspondents. How that prediction was verified I now proceed to point out.

Early cases

The mortality now reached 671, of which the zymotic ascended to 143, consumption now declined, diseases of the nervous system reached 145. There were only two cases of yellow fever formally reported on the *mortuary record*, though the investigations of the Sanitary Commission have discovered several others, and there were several recoveries during the month from the disease, occurring in different parts of the city, without any intercommunication in private practice, in the upper part of the city.

In June.

During June the maximum temperature was 91° on three several days, the minimum 73, the average outside (as before) 80.73, and inside 81.46, and the range 21. The average dew point had now reached 73.20, its maximum having been upwards of 80, and its minimum 66.3. The average humidity was .815; the average amount of moisture in a cubic foot had reached the large amount of 9.136 grs., nearly three times the amount in January. The maximum solar radiation was 35. It now became greatest at our nine o'clock observation,

Tropical character of the season.

which, with the almost daily showers, showed the tropical character of the climate we were now experiencing. The rains in May were about weekly; on the 9th of June the rains set in, and fell almost daily the rest of the month. The barometer continued unusually high, as it had done, and which continued during the existence of the epidemic, not finally falling until December, coinciding with an observation of Mr.

High barometer.

Prout, preceding and accompanying the outbreak of the first great epidemic of cholera in London, this rise being cotemporaneous with the occurrence of Easterly winds; accordingly the NE., E., and SE. winds now predominated greatly, with that influence on the system they are always known to produce, the first, especially, during our epidemics. The rise was ascribed to the diffusion of some gaseous body through the air of the city considerably heavier than the air it displaced. —The mortality had now reached, during the month, six hundred and fifty-six; consumption, which had formed a prominent feature in the weekly mortality, was now greatly reduced, near to its normal standard; and scarlatina, which seems to be a prodrome of the epidemic yellow fever here, as it is in various other countries, was now reduced to half its mortality during the preceding month, and thence gave way to the epidemic, and scarcely made its appearance again, until December. Precisely opposite was the influence of the season on the class of *nervous affections*; almost keeping pace with the epidemic, it reached its acme at the same time and then declined. The class was unusually large throughout the year.

Antecedence of scarlatina.

Predominance of nervous affections.

The zymotic class began now rapidly to augment. Bilious remittent, pernicious, typhoid, and malignant fevers greatly increased, and more than twenty deaths by yellow fever were reported.

In July.

We are now approaching the limits of that great epidemic influence, which so severely afflicted our city, and extended its ravages in an unprecedented degree, nearly throughout the Southwestern states; in many instances even desolating portions of the rural districts, for the first time. The period of its commencement may be fairly dated from the second week in July. By that time physical agents had sufficiently matured their power to show their influence on man. Let us not exclaim, at this late day, as of old, "*vis est notissima, causa latet.* It is the duty of the profession, standing as sentinels upon the great watch-tower of public safety, (as to health,) to find out the causes of effects so disastrous. Providence permits no evils, without there being corresponding remedies; and these remedies can only be properly understood or applied, but from a previous knowledge of their causes.

Duty of physicians.

No evil without a remedy.

To the meteorologist, to the observer of causes and effects, and the influence of physical agents, the phenomena precursory to, and during the existence of an epidemic, are not at all obscure. The alarm, the agitation of mind, the anxiety for the sick, which usually exist at this period, is not very favorable to exact observation. The difficulty then exists to curtail the exuberance of the imagination, and record the nakedness of truth. A distinguished French traveler, (Chateauvieux,) in describing an epidemic, says: "No visible signs mark the existence or approach of this pestiferous air. The sky is as pure, the verdure as fresh, the air as tranquil, as in the most healthy region. The aspect of the elements is such as should inspire the most perfect confidence; and it is impossible to express the horror which one experiences, on discovering that all this is deception; that he is in the midst of dangers, of which no indication exists, and that, with the soft air he is breathing, he may be inhaling a poison which is destructive to life." Now this vivid description, although generally credited, is mostly a fancy sketch; and the philosophic observer should interpret the facts as they really exist; the "pure sky" is evidence of excess of radiation, and the "tranquil air" is but stagnant, suffocating saturation, or the wind blowing from unusual quarters, laden with moisture, or deprived of it, (as the simoon,) is destructive to the vital principle. The filth and the stinks around him, warn the observer that the elements are at war with his being; that his constant skill must be exercised in the application of corrective measures, and that the equilibrium of his constitution must be constantly maintained. Elemental disturbances did exist, both precedent to, and during the epidemic; and a long experience, of near thirty years, has shown me that they have *always existed;* if they have not been always properly interpreted, it was because the precision of science was not so rigidly applied to the laws of causation, nor were her votaries then required to explain everything, as now.

Interpretation of physical phenomena.

Prodrome of the epidemic.

A disruption of the ordinary catenation of seasons was early apparent. The winter was unusually mild; great and unusual radiation evinced an elemental derangement. Spring came "before its time;" summer leaped into her lap; and this brought, before the system was prepared for it, blighting autumn with its associate diseases—the full force of radiant power, great heat and intense saturation. Here was one branch of the "shears" prepared for its influence; the other was supplied in a most unusual disturbance of the earth, and the presence of excessive filth.

On man this great epidemic was not heralded (as is often experienced) by the severity of its *avant couriers*; no precursory violence announced the approach of the disease; it was mainly in the atmosphere that that portion could be predicated from (radiation); on earth all was quiet and calm, but, as it often happens with cholera, it was the "torrent's stillness ere it dash below," with a few cases of yellow fever as early as May, as a kind of warning to the authorities, which increased to twenty in June, still unheeded; during July it rapidly, but regularly augmented, at a geometrical ratio, each successive week, and when it reached upwards of one hundred victims a day, our drowsy Councils established a Board of Health!

No precursory influence on man.

During July the maximum temperature was 89°, minimum 71, average outside 79.88 and inside 81.68, (our table in the appendix is limited to outside temperature); the outside had been lowered by frequent rains, as is usual in tropical countries; range 18. The average dew point 72.13, the highest being 80.9, and lowest 66.5, (the day after!) The average daily humidity .825, the *average at sunrise* being .930. The average amount of moisture in a cubic foot being 8.798 grs., the *average at sunrise* being 9.600! The maximum solar radiation was 32°. The rains were now truly tropical, not only in number but amount, having rained on eighteen days and four nights during the month. The thermometer continued very high, and averaged 30.265, its maximum this (as during last month) being 30.37. The predominant winds were now mostly from our rainy quarters, SW. and W., blowing over

Great moisture.

an extensive region of swamps, and the bed and banks of the river for upwards of eighty miles. But what most distinguishes the month in this respect was the unusual number of calms noted in my register, amounting to twenty-six during the month, showing, nearly one-fourth of the month, the atmosphere to be in a stagnant condition, hot, saturated, filthy. The gutters were, twelve hours after a rain, reeking and bubbling up with gaseous products, all highly inimical to animal life. (I am indebted to my friend, Dr. Benedict, for keeping my meteorological journal this month.) The consequence of all which was a total mortality of 2,216, and the epidemic being fully established, those from yellow fever amounted to 1,524, and the whole zymotic class 1,734.

Great stagnation of air.

Filthy gutters.

In August.

During August all the meteorological and mortuary conditions reached their culminating point, *and about the same period*, as will be seen by reference to the chart B, and the tables C, D, E, in all which this is shown in great detail; the influence and the inference are both clear and indisputable. The maximum thermometer was 91°, minimum 72°, average 81.25, the maximum dew point 79.4, minimum 66.2, and average 78; average temperature of evaporation 76.13, average barometer 30.194, average humidity .873, average at sunrise .950, only requiring one-twentieth more for complete saturation *every* morning! this being actually noted at fourteen observations, the number of grs. per cubic foot, on an average for the month. being 9.737 grs., and at 9 P. M., being 10.045. more than three times the amount in January, and at the highest temperature, the highest solar radiation having attained the almost unprecedented height of 61°! although there was but one day during the month that was marked *entirely clear* the whole day, (the 30th,) raining nearly every other day, some days two or three times in succession, and the amount during the month reaching 7.016 inches. The winds were mostly E. and NE., and the number of "*calm*" days, without a parallel here, amounted to seventeen! or, at *sixty-eight observations*, evidence of a close, suffocating, inelastic atmosphere, which, with the antecedents and

High temperature, and almost average saturation.

High radiation.

Unprecedented saturation.

Unparalleled stagnation of air.

terrene accompaniments, most satisfactorily accounts for the unprecedented mortality. This amounted to 6,201, and the mortality by yellow fever to 5,269, the whole zymotic class, dependent upon the same general conditions, being 5.338, besides the "unknown," and diseases of the nervous system 209. Mortality.

The month of September has been usually the most fatal month, on an average of more than half a century here. This year, however, it was something less than one-fourth that of August. The meteorological condition had materially changed, the maximum temperature being 86°, minimum 60, average 76.23. The maximum dew point 78°, the minimum 50.3, and average 70.93, average temperature of evaporation 72.44, average barometer 30.191, average humidity .857, the highest solar radiation (in the early part of the month, the 4th,) being 45°, winds mostly N., E., and NE.. The rains continued until the 13th, amounting during the month to 5.045 inches, a large precipitation for September. After this there were but two light showers, and the disease rapidly declined with the change in the meteorological condition, which was considerable in every particular. This is a uniform fact, and especially in reference to the hygrometic, as shown by reference to my records of former epidemics. In Septemb'r. Great climatic change.

The whole zymotic mortality was 1121. The yellow fever being 1066, and the epidemic, with the climatic change in the second week, evidently declining—the whole mortality for the month amounting to 1627. Attention is invited to tables C, D, E, which contain the daily meteorological and mortuary condition in great detail during the three epidemic months, and I would gladly add the whole year of both, could the latter be obtained, for the gratification of scientific men, to show how much climatic conditions influence our health, and especially during this remarkable year. In interpreting the connexion of meteorology with *mortality*, two circumstances are to be taken into consideration: First, the amount of vital resistance to be overcome previous to the attack (for it is never at once.) Second, the period to elapse before resulting in death. These, as yet, are undeter- Epidemic retiring. The mode of interpreting the influence of meteorology on mortality.

mined and irregular, dependant upon individual susceptibility and constitutional power. The second is easier estimated than the first—for the *average* duration of the *disease* is known to be from three to five days. The *period of incubation* is less known. We sometimes find, in the advanced period of the season, that a sudden great fall in temperature produces a frightful mortality; cutting off at once all who are very sick, unless carefully protected; and here a little foresight of a coming change can often be put to most valuable use. In this case it is almost equally apt to prevent the farther continuance of the disease, *provided the change is a permanent one.*

In October.

During *October* the maximum temperature was 81°; minimum 48°, and the average 66, 81; the maximum dew point 74° 5; minimum 31° 9; average 59° 31. The average temperature of evaporation 62.30; average barometer 30 231; average humidity .804; maximum solar radiation 41°. Winds mostly from East and North but two days, on which it rained until the latter part of the month, one night preceding the frost of the 25th, and having rains two days after, amounting in the whole to 5.175 inches, which exceeds the amount of precipitation for any October during the last ten years, excepting that of 1849. Range of "*drying power*" during the month, 30. Here is a great reduction in the destructive elements in every particular, and the mortality greatly declined. Indeed, this has continued pretty regularly ever since the 10th or 13th of September, about which period the climatic changes occurred. These are often more obvious to one's feelings than by our instruments, and the time is not distant when these can be stated more precisely. The mortality from yellow fever during the month was 147; of the whole zymotic class 243, showing that the epidemic feature had almost entirely departed. The entire mortality was 674.

Climatic change continued.

Epidemic, as such, ceased.

In November.

During *November* the maximum *temperature* was 75°; minimum 45°; and average 66.92. The maximum *dew* *point* 69.5; minimum 36.1; average 59,46; average *temperature* of *evaporation* 61°.85; maximum solar radiation 46°. Winds mostly East and Northeast. This direction of the winds has been very remarkable and particularly from the East for the last four months, exceeding the average of the last five years at least 200 per cent. The maximum barometer occurred on the 18th, and was 30.46—a very unusual heighth here—soon after which the cholera broke out. The average for the month was 30.329; average humidity .846. There were but three days of rain until the 26th, '7th '8th, '9th, when they were heavy, and the amount, of precipitation for the month reached 7.032 inches; range of "drying power" 20.

Unusual East winds.

The average for the month was 30.329; average humidity .846. There were but three days of rain until the 26th, 27th 28th and 29th, when they were heavy; and the precipitation for the month reached 7.032 inches. Range of "drying power 20.

The mortality for cholera was 177. The yellow fever mortality was but 28; and the whole mortality 987; and the zymotic class 318.

The condition precedent to and accommpanying a disruption of the cholera here, is irregularity of *climatic movements*—a high and low barometer, and mostly the latter—and a high and low drying power, mostly the former.

During *December*, the maximum temperature was 68 on the 8th, and the minimum 34 on the 20th—the maximum dew point 65, minimum 24.2 on the 31st—average temperature of evaporation 50.67, maximum solar radiation 25°, winds continued from East, North, Northeast, the maximum barometer 30.48 on the 2d, when the cholera was at its height, and declined to its minimum 29.57 on the 30th, much the lowest point it had reached during the year. Average humidity .823, and the average number of grains of moisture in the atmosphere was 4.167 to each cubic foot, less than there had been since January. There was but one slight shower of rain to the 13th, and this occurred on the 7th; the amount was only 200th of an inch—the total for the month

In December.

Great barometric variations.

Air comparatively dry.

was 4.560, and under the average for *any December.* The cholera ceased soon after the middle of the month. New Orleans was in no condition to *localise it, as at this period there had been some attempt, during our long scourge of yellow fever, to cleanse* the city! This epidemic, so different from its predecessor and incompatible with it, is doubtless influenced by meteorological conditions that differ also. They have never existed here as *epidemics* together, they consequently depend upon somewhat different elements for their existence, as such. The latter requires exalted temperature and high saturation, and is essentially a disease of the hot season—the former exists in a lower temperature, with much less and very *variable humidity* and *great variation of the drying power*, often very exalted, (such at least, has been the case in this climate,) irritating, by rapid evaporation, the mucous surfaces, producing in them an erethism, always a prodrome of the disease—such is just the condition attendant on epidemic influenza—the almost universal precursor of cholera. The dew point is also essentially different in cholera from* what it is in yellow fever. While in the former it varies from 48° to 70°, in the latter it rarely descends below 60° and ascends to 80°—these are very remarkable differences. I speak of that state of the atmosphere sufficiently aggravated to produce an *epidemic* of these diseases respectively. I do not here allude to incidental, sporadic or endemic cases; *they* may occur under circumstances somewhat different from these, and are dependant upon local circumstances that have not been subject to analysis. And be it remembered that I speak of the climate of New Orleans, with the records before me. The predominant winds are also different—while in cholera they are the East and Southeast, in yellow fever they are the East and Northeast.† The individual liabilities are also different; while

Parallel of cholera and yellow fever.

Climatically and physiologically.

Their dew-points.

Do. of winds.

* Or lower.

† How deeply it is to be regretted that there is no meteorological record of that remarkable occurrence of cholera here in the fall (Oct.,) of 1832, when the yellow fever existed to a great extent in this city. A *few days* after its outbreak, the yellow fever entirely disappeared, and was thoroughly supplanted by the worst cholera epidemic ever witnessed in this city. Being on a visit to the cholera districts in the North, I did not reach here until it subsided, which was as rapid as its advent, from a sudden fall of temperature with North winds. In the epidemic cholera of the

with the former, a full habit—sanguineous temperament and high living, predispose to the disease, it is a protection to the latter. The one attacks the cerebral and sanguiferous system and mucous surfaces—with the local developments dependant much on the habits and condition of the individual, the other attacks the great system of organic life, giving increased activity to one secretion, whilst paralysing all others, leaving cerebral life, with all its integrity, to the last moments of existence. The one occurs with a high atmospheric pressure, the other under a low one, or this predominates. Both belong to the zymotic class, they are invited and localised by filth—want of ventilation, &c. The difference in the climatic elements may greatly aid in explaining their different effects on the system. Such certainly is the result of our experience here in the several epidemics of cholera which have occurred in this city during the last twenty years, and the very fact that they never prevail together, but successively here, is a proof of the correctness of the remark that it arises from the difference in the meteorological elements, that constitutes the sole or principal dissimilarity in the remote causes, and that, still, if the localising condition, (filth, the hot bed of corruption and vitiation) be not present, immunity is enjoyed.

Pathological differences.

The mortality from cholera, during the month was 332—of yellow fever but 4—of the whole zymotic class 429, and the total mortality for the month 844. The table F, prepared by Dr. Macgibbon, for the Sanitary Commission, embraces the detailed mortality for the whole year, classified, with the months, ages, nativities, colors, sexes, &c., and made as correct as it was possible, under the difficulties of procuring the materials.

Mortality of the month.

After this detailed application of the meteorological condition and its special consequences, in this most remarkable year, it

succeeding year, I find no record of the dew point in my meteorological journal, (hygrometric observations were only commenced by me in 1834, and have been kept up ever since.) But I find in my journal of the period of the epidemic "a great fall in the thermometer on the 8th June, (and of course the hygrometry) a heavy fall of rain on the 9th, over five inches, and severe thunder and lightning; a change of wind from the Southeast which had predominated, to the Western quarters, and the disease gradually declined, it *reached its acme on the eighth!*" and terminated about the 25th.

will be instructive to review the two conditions productive, in combination, of such disastrous results, and see how they differ from those of other years. If in the appreciation of those at the command of science—the causes pointed out do not seem commensurate with the results, it is to be recollected, that it is but "yesterday" (as it were) these definitive causes have been developed by scientific investigations and applied to human maladies, that in the great store house of nature, the mightiest results have been caused by apparently the most insignificant means, and that in *no human infirmity* can we yet measure the *precise amount of causation.*

Great results often proceed from apparently insignificant causes.

The annual *average temperature* in 1853 has been less by about two degrees, and this has occured during the rains, it has been accounted for by Prof. Blodget by the tropical character of the season, the daily curve of temperature being much less sharp during the rainy season, hence the daily mean of temperature is less than usual, this has been specially verified here. *More rain* has fallen than any year during the last thirty excepting a fraction more in 1839.* The *barometer* has been much higher than any year I have ever noted it, and continued so until some time after the occurrence of the cholera in December. The *winds* have been nearly one-third more Easterly than during the last five years, and especially during the epidemic; more Northerly—not half the usual Southerly winds, about one-third more of Westerly winds—in this respect, what has eminently distinguished the season has been the unusual occurrence of *calms*, or stagnant state of the atmosphere, for the whole year; it has been about four times as many as usual, and for August more than eight times as many calms as the average of the last five years. The "*drying power*" has been greater for the whole year than usual and especially for December. The *radiation* was materially different, as is usual, in yellow fever years, the highest amount existed during the yellow fever, (and this is commonly in September,)—this year the largest mortality oc-

Climatic peculiarities of the year.

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*I was not here in 1847, being absent in Vera Cruz—more rain is alleged to have fallen then.

curred during August, accordingly the highest radiation occurred then. In a series of non-yellow fever years, the culminating point existed in May—vegetation probably then requires it most.

High radiation and sickness concomitant.

So great is this "drying power" in a climate where moisture is deemed the "*only sinner*," that at times it becomes very embarrassing in the treatment of disease, and it is of great importance to remdy it. It occurs not only in cholera, but in cramp, in rheumatism, in pneumonia, in scarlatina, and sometimes even in yellow fever; it makes the meteorology of the sick room a part of the proper armory of the profession. Covering the body with blankets and bed clothes does not prevent the rapid evaporation that ensues, in a dry period, not only from the surface of the body, but from the lungs. In the more elevated sierras of Mexico, where the perspiration passes off with such celerity, from diminished atmospheric pressure, that sensible perspiration (or sweat) is not often or long seen, there is worn a kind of close woven (or Canton flannel) under garment, that resists this rapid desiccation, and is very comfortable. I am in the habit, at times here, of changing the hygrometry of the sick room by having water poured on a heated iron. Too much dryness, then, may be a cause of disease as well as too much moisture.

Effect of great "drying power."

England, enveloped in her fogs a large part of the year, is, with her *low temperature*, one of the healthiest countries in the world; while New Orleans, with her great moisture and *high temperature*, complicated as it is, with other powerful agencies, is one of the sickliest. The exact amount required for health is a subject for future investigation. The Sanitary Commission has tried, in vain, to procure such an array of facts during our last memorable year, as to justify some generalization on the subject. It is not abandoned; it is too valuable, if such a record *can be* procured of the exact *period of occurrence* of the principal classes of disease of a year so distinguished, as well for its meteorological as mortuary condition, it should be done. The meteorology of it

Difference between moisture and high and low temperature.

we have. But three professional gentlemen, Drs. Benediet Kovaleski and Copes, answered our eireular, furnishing *dates of the occurrence of cases of disease during the whole year*—too few for important deductions.* It does not require that statement to show whether meteorology has any influenee on man, there is not a day or month of this, or any other year, in whieh this is not shown to the satisfaetion of every mind capable of observing, and not elosed against eonvietion. The contrary supposition embraces the belief, neither more nor less, that man is independent of climate—nay, of external agents—is so absurd that I dismiss it with no further notice than this bare referenee to the hypothesis that has nothing reasonable to support it.

In closing this imperfect analysis of the "epidemie eonstitution," it is proper to refer to those speeialities for which this epidemic is entitled to the paternity. Hereafter it will be shown that the fever of this year has been the same in all its essential features with those of preceding years, with the usual variation for season, and that all the stories of its African, Rio Janeiro or West India nativity, are as equally groundless as the importation of the epidemic itself. It is doubtless true that its malignity was hardly ever equalled with us and that there were sections of the city where many cases terminated within twenty-four hours from the eommencement. It was remarked that an unusual number of ehildren were attacked, even those born here, *unless both parents were themselves creoles*—a much larger proportion of the colored population than common; the remarkable number of forty-four are reported (although *much less* than in the country)—females also suffered more, and especially those pregnant, than in any year since 1835—a fine miliary eruption was usually seen on the skin within twenty-four hours from the attack—it was the harbinger of safety as long as it kept out—

Pecaliarities of the season.

Creoles exempt.

Influence of color and sex.

* Sinee the above was written I have obtained, with the assistanee of the Sanitary Commission, near 10,000 cases of certain classes of disease, supposed to be most under the influence of meteorological conditions, at the dates of their occurrence, during this interesting year (1853), which I intend digesting with their corresponding meteorology at as early a period as practicable.

its repulsion the signal of great danger if not of fatality; this was followed during convalesence, with troublesome furunculi, throughout the body, it even occurred in many who had not the fever; this same eruption characterised the great epidemic yellow fever of Philadelphia, of '93, many were affected with carbuncles, and in several instances buboes during the fever. The perspiration was offensive even with those who were careful enough to bathe twice a day, the same was noticed of the above Philadelphia epidemic. The appetite for strong food and drink was materially lessened with those who had extensive and exhausting professional labor to perform, and its indulgence increased the exhalation from the body above spoken of. These, however, I have repeatedly observed in former epidemics, a large proportion of the telegraph operatives fell victims to the fever.

Eruption, carbuncles, and buboes.

The stimulus of the generative power, which the distinguished historian of the great Philadelphia epidemic of '93, Dr. Rush, mentions, and the facility of and liability to conception, even with those who for ten or twenty years had ceased bearing, also existed; (noticed here by me, and published in my account of the yellow fever of 1833;) it seemed a kind of law of compensation like that which attaches to the poor in sickly countries; of multiplying their births in proportion to the mortality. The rise and decline of the mortality in the zymotic class (or preventible mortality) has been traced in its successive monthly stages, its culminating point this year being August instead of September as heretofore, uniformly, unless when epidemic cholera shall have been the principal disease; this being essentially a winter disease with us, or at least, occurring at any other season than the summer, it makes the angle in that part of the chart A designating the *monthly liabilities*, much less sharp for September than it otherwise would be.

Law of compensation.

Class III, of monoxysmal or *contagious maladies*, had its greatest prevalence in May, and was at its minimum in September.

In May most contagious malady.

The class of "nervous diseases" had also its culminating point with the highest temperature in August. That of pulmo-

Nervous diseases in August.

Reverses of the pulmonary.

Intemperance most injurious in summer.

Thunder storms and lightning during epidemic.

Unless a hurricane.

Gas in the gutters soon after a rain.

nary affections again reverses the figure. Intemperance reaches its highest amount as the fears of the fever increase, and doubtless added an immense amount to the whole zymotic class. This table shows here, as every such table shows, that the "unpreventible diseases" are a constant quantity, and that our enlightened efforts are mostly to be directed to the variable classes (mainly the "zymotic") which man has (most fortunately), so much power to control. There exists a popular error of the "purifying" influence of storms accompanied with thunder and lightning; it is something similar to that denominating a heavy atmosphere (high barometer) "light"—because with a low temperature it is bracing, and a light atmosphere (low barometer) "heavy." Storms of thunder and lightning, I have noticed for thirty years in this country, to exist during epidemics, and instead of "purifying the atmosphere," to injure the sick; they existed throughout the epidemic here and elsewhere last year, They have been noticed during the epidemics at Rio and Demarara and other places. It is the opinion of many physicians in tropical climates, (Belot at Havana, and others at Rio, &c.,) that this development of electricity increases the cases of yellow fever; that in proportion to the violence of the storms the disease augments in violence and that it aggravates existing cases, (and so in cholera,) unless a hurricane occurs, when (so great is the change) there at once occurs a great temporary abatement of the disease. The frequency of the rains are shown and their amounts during the epidemic months, exhibited in the meteorological tables for those months, in detail. It was remarked also as frequent as the gutters were thus cleansed when stagnant water still remained, that discolored slimy pellicles covered its surface, bubbles would issue, within twelve hours after these ablutions; I called the attention of my chemical friends to it and advised its annalization. It is to be greatly regretted that the arduous nature of our professional duties during a severe and exhausting epidemic curtails greatly our ability to make that extended sphere of experiments which science and humanity both demand, for these are twin sisters, and the measure of the utility of the one depends upon the extent it can advance the other. This is our apology for not accomplishing more in the most memorable year for both that our country has yet known, and we feel humbled at the small offerings we have been able to make at the altar.

It is as well to mention, without knowing that there exists any connexion between them, that there was a slight shock of earthquake at Biloxi about the period of the occurrence of the fever there; that simultaneous with the outbreak of the fever here in May, there were earthquakes in Georgia, and that at the precise period when it was most fatal viz: the 20th and 21st of August; there were earthquakes in Ohio and Thebes, all of these were attended with thunder and lightning.*

Earthquakes during the summer.

SECTION III.

Estimate of the life cost of acclimation in New Orleans from nativity—to the natives of Louisiana—to those of the Southern and Western States—to the Northern States—to the North-Western States—to the British population—to those from the West Indies, South America and Mexico—to those of Great Britain and Ireland—the North of Europe—of Middle Europe—of Western Europe—of the mountainous parts of Europe, and the South of Europe, together with the probable causes of the remarkable differences.

The classes of our population, with regard to their social position on whom this epidemic has borne most heavily, connot be shown by any recorded proofs; and must be left to be inferred from the exhibits from the several cemeteries, in which they were interred, and they are to be seen in Table H. The poor are the greatest sufferers always, and especially in insalubrious places, and during epidemics; they live in more crowded, filthy, and uncomfortable dwellings. They are ignorant mostly of sanitary laws, are unable, or find it inconvenient to apply them, and hence, require the strict surveillance and kindest concern of a paternal government. The most of those

Social position as represented by the cemeteries.

*Meriam.

who constitute this class, are the *hands*, the *machinery*, that make the wealth of a community, and give it its power; and hence, are the rightful claimants of its fostering care.

Cost of acclimation.

Table H, has been constructed from the materials of which our mortuary table of GENERAL MORTALITY has been formed, to show the liabilities of our heterogeneous population to the epidemic yellow fever from NATIVITY. For this Mr. De Bow (our fellow townsman) has kindly responded to my request, and fur-

TABLE H.

COST OF ACCLIMATION,

SHOWING THE LIFE COST OF ACCLIMATION; OR LIABILITIES TO YELLOW FEVER FROM NATIVITY, AS EXHIBITED BY THE EPIDEMIC OF 1853, IN NEW ORLEANS.

	NATIVITIES—STATE AND COUNTRY.		Population in 1850. United States.	Estimated population in 1853.	Estimated mortality from Yellow Fever	Ratio per 1000 of the Population.
1 2		New Orleans, State of Louisiana,	38,337	46,004	140 25	3.58
3	Southern States.	Arksnsas, Mississippi, Alabama, Georgia, South Carolina,	2,655	3,176	42	13.22
4	Northern Slave States	North Carolina, Virginis, Maryland, Tennessee, Kentucky,	4,160	4,984	153	30.69
5	Northern States.	New York, Vermont, Msssschusetts, Maine, Rhode Island, Connecticut, New Jersey, Pennsylvania, Delaware,	8,898	10,751	353	32.83
6	N. Western States.	Ohio, Indiana, Illinois, Missouri,	1,693	2,030	92	44.23
7		British America,	318	381	20	50.24
8		West Indies, South America, Mexico,	1,693	66,945 1,790	.825 11	12.32 6.14
9		Great Britain,	3,832	4,598	240	52.19
10		Ireland,	22,093	26,611	3,569	204.97
11	Northern Europe.	Denmark, Sweden, Russia,	491	588	96	163.26
12	Middle Europe.	Prussia, Germany,	14,765	17,718	2,339	132.01
13	L'w Western Europe.	Holland, Belgium,	127	152	50	328.94
14	Mountan'ous Europe.	Austria, Switzerland,	663	797	176	220.08
15		France,	8,306	9,967	480	48.13
16	Southern Europe	Spain, Italy.	1,848	2,217	61	22.06
			109,679	62,648	7,011	111.91

* These were not all the Statea represented by population in New Orleans; but they are all that were debited by deaths from yellow fever, and all that could be estimated from; although there were 26,590 that were necessarily unrepresented in these calculations, most of whom, were colored, however.

nished me, from the U. S. Census Bureau, of which he is the honored and intelligent head, the aggregate and nativities of the population of the city for 1850. That furnishes the first column; upon that I have calculated the population for 1853 for each country respectively, by adding a fractional increase per cent. over that from 1847 to 1850, (the most recent fixed periods;) that supplies the second column. The third is derived from the Cemetery Reports *during the prevalence of the epidemic*, but as there was a large number that was classed as "unknown," it was deemed the nearest approximation to the truth, as in all our records it is little better than *approximations*, to add a large per cent. of these, for such is the negligence herein relation to such records, where there is neither law, responsibility or appreciation, that the statist can only be expected to *approach* the truth, however desirous he may be to be *exact*. These, then, I have divided among the known in the proportion they bore to them respectively. Accordingly, this column was thus constructed, and it is believed not to vary greatly from the truth. It carries, at least, strong probability in its favor. The fourth column results from this, and furnishes the ratio of mortality per thousand of the population. Upon this foundation we arrive at the following remarkable results, which, if correct, furnishes the *cost of acclimation* to every description of our population.

Mode of constructing the table.

The estimate for New Orleans is very imperfect. In the census with which I have been kindly furnished, the nativities of the *city* have not been seperated from those of the *State*, and hence are aggregated together. The mortalities of the natives of New Orleans from yellow fever have almost entirely been confined to those under ten, with very few exceptions, and still only amount to 3.58 in a 1000.

Cast in New Orleans.

While the proportion is shown to be pretty much the same in the range of States along the Gulf and South Atlantic (none being recorded for Texas and Florida,) the *average* shows but 13.22 in a 1000, or about $1\frac{1}{3}$ per cent., which is small for the population, and is very small even for bilious fever, and will

Do. in the extreme Southern States.

fully sustain some views in relation to the *identity of the origin and nature of these fevers*, in a future part of this Report.

Do. from the Northern slave States.

The next range of States farther North, being the Northern slave States, or middle States of the Union, are subjected to a cost of acclimation which is more than double that of the more Southern States; it amounts to 30.63 in a 1000, or a fraction over 3 per cent. This was to be expected; the winter climates are as different in their temperatures, as the summers in their hygrometric properties.

Do. from the Northern States.

The next group embraces the *Northern States*, which still farther increases this difference, being 32.83 in a 1000, or nearly 3⅓ per cent. It is probable that the habits of life between these two sections are more influential in the production of this difference than the climates.

Do. from the North western States.

But what shall we say of the Northwestern States, having an increase over the Northern States of *more than one-third*, or more than three times larger than the Gulf States, being 44.23 in a 1000, or nearly 4½ per cent. This is a large increase, and is not accidental; it is regular. The States of Tennessee and Kentucky, which form the Western part of the group of our Northern slave States, is considerably larger than the Eastern.

Probable causes of this difference.

The great difference in the life-cost of acclimation between the Northeastern and Northwestern States, and those from their brethren farther South, probably, in great part, arises from their habitual indulgence in animal food and general gross living at every meal, more than in any part of our country, or probably the civilized world. This habit is not readily dropped; when they immigrate South the process of animalization is accompanied with the evolvement of great heat or combustion, and is incitive to, and apt to produce fever. This calorific process is but slowly adapted to the requirements of the climate, and the habit and its consequences are productive mainly, in our opinion, of the foregoing results. It is at least suggestive of valuable hints, and should not be lost sight of. Man can adapt himself to any climate, but it is mainly through his living. This is proved by the valuable and interesting experience of Northern voyageurs, who find their crews resist the rigors of a Northern winter in proportion as they adopt the mode of living of the natives. It is perfectly reasonable. Where man resists it, and carries the habits of one climate into another, he pays for it by abbreviation of life.

British America still rises in the scale, and illustrates its value and correctness. It amounts to 50.24. **Do. from British America.**

It is equally proved by looking at the small influence from change of climate on those from Mexico, South America and the West Indies, where the great contrast is shown by the exhibit of only 6.14 in a thousand, and doubtless, these derived their liability from coming from districts where the yellow fever is unknown, for the opinion is entertained, by the reporter, that the acclimation to the disease in one climate affords immunity throughout the zone. **Do. from S'th America, Mexico, and West Indies.**

So much for the NATIVES of this continent, showing an *average* influence of this change of climate on them of about 12.32 per 1000 in order to acquire perfect acclimation here. Of the *colored population* there are no records but that of death, and the remarkable number of forty-three is given in our mortuary table for last year, a number utterly unprecedented in our annals, although it has been much greater in the country. The *nativity* of the slave population is not given. I do not remember ever to have met with a case of death in the black population during the prevalence of this disease in the West Indies, except during the recent outbreak. **Total, 12 1-3 per cent. for all America.** **Mortality of the colored.**

The table exhibits, as we proceed down the columns, a still more serious result from change of climate, while the mortality of the natives of France, with their temperate living and habit of adaptation, have now reached 48.13 per 1000; those from England, generally a rather choice population, with fine constitutions, but with national obstinacy in relation to diet, have ascended to 52.19, probably from a much fuller habit of living, not readily adapting itself to the requirements of a warm climate, and at least this difference, if not more, exists wherever these two **Do. from France.** **England** nations are exposed to similar influences in a hot climate, and most probably from the cause stated.

Do. from Ireland. Those from Ireland reach the enormous amount of 204.97 in 1,000, showing the consequences of an entire revolution in everything, climate, diet, drink, social habits, all that elevates man to the dignity of his being, from moral, political and physical degradation and subserviency, with propensities and dispositions the most reckless.

Cause.

From North of Europe. Those from the North of Europe are also very large, 163.26. The difference of climate is very great, and men will not, until after much suffering, adapt their habits to altered condition.

From Middle Europe. Those from Middle Europe, it will be seen, are much less, 132.01 in 1000, although still very large, and the same remarks apply here as in those of Ireland, although the social change is not so great, and there exists among them greater constitutional prudence. With these, and indeed, all European immigrants, and particularly, among the Irish, a propensity to crowd their families into a small space, with the inevitable result of accumulation of filth, and deficient ventilation, is eminently conducive to a greatly enhanced mortality.

From Holland and Belgium. But still, the largest mortality in our table is found to exist among the immigrants from the *low regions* of Western Europe, reaching the highest elevation of 328.94 in 1000. Holland and Belgium are low, flat countries, with much moisture, which, at a low temperature—with proper comforts of life, is not incompatible with great salubrity, but when these are exchanged for a climate of *high* temperature and great saturation—and these will be shown hereafter to be a material part of the conditions most inimical to health—together with a total disruption of his social habits, the influence on the constitution is most deeply felt, as recorded.

Probable cause.

From Switzerland and Austria. But the climatic change from the high, mountainous regions of Europe, (Switzerland and Austria,) with their low temperature, dry, elastic air, and plain food, to the heat, moisture and different social condition which they soon reach here, is productive of consequences, although great, scarcely sufficient to account for the large mortality of 220.08 in 1,000. Elevation then, in a temperate climate, in its proclivity to develop the sanguine or blood-making and heat-producing system or temperament, so different from that of warm climates, where the bilious temperament predominates, and which is so much better adapted to it, must aid in accounting for this large mortality. This is eminently illustrated in seeing how small is the mortality in the natives of Spain and Italy, about one-tenth of those just mentioned, or 22.06 in 1,000, and who are almost uniformly of the bilious temperament, living on a milder vegetable regimen and great temperance, which this temperament instinctively calls for.

Accounted for.

From Spain and Italy.

Probable reason.

SECTION IV.

Total population of the city during the year; estimate of the unacclimated; number of cases of yellow fever in public and private practice; ratios of mortality in each; comparative mortality in other countries; mortality in our rural districts, &c., &c.

The total population of the city of New Orleans, by the United States census, in 1850, was............129,747.

By adding the ratio of increase from 1850, and carefully and laboriously calculating, from the varied and imperfect returns of the city census of 1851,–'52, for each ward and class of the population, so far as it was possible to procure them, I have arrived at the conclusion that the augmentation, in our aggregate permanent population in 1853, amounted to.............154,132.

Total population in 1853.

It is well know the increase has been much greater, especially of the floating population.

The difference between the population during the last preceding epidemic, in 1847, and that of 1853, is 45,433; to which add 5000, a very small estimate of the floating population, and of that large class of denizens, who have their actual homes here, but are a

Difference of population in 1847 and 1853.

large part of their time absent, and which are embraced in the enumeration of the population of other large commercial cities (more particular in this respect) all of whom are unknown to our census returns, and who generally form the *first victims* of an epidemic; and we have an unacclimated population of 50,433. But as no epidemic so thoroughly influences the whole population, as to leave none still susceptible to attack, and we well know even the last did not, and that was the most thorough and wide pervading we ever had: whole families escaping, and of course, the disease did not stop for the want of subjects. In fact no epidemic so thoroughly influences the entire unacclimated population, in any city, so that none escape; may be from some transient or accidental cause, although they may be subject to it afterwards, as we now well know. During the existence of the plague in Marseilles, in 1720, when *near half the population* fell victims to it, amounting to 40,000—thousands did not suffer at all, out of a total population of 90,000. It is probable that more than double the number was left untouched in 1847 than were taken sick; it is deemed fair to estimate the total *susceptible* population, in 1853, at......... 60,000.
And the entire city population, at.................158,699.

Total unacclimated population.

This will be considered moderate, when I add that our foreign immigrant population, arriving in the city, to the month of June, '53, reached near 24,000, many of whom doubtless remained.

Number supposed to have left the city.

On this as a basis, I have supposed there left the city, before or through the epidemic, and thus reducing our population to that extent,..................... 36,283: being something less than one-fourth. I have come to this conclusion, after a very minute examination into all the records and sources through which this extensive emigration could take place, viz: by the river, and through the lake; by public and private records;

Number in the city during the epidemic.

and deducting the ingress from the egress. To be more sure, I have consulted the judgments of those who have been here, like myself, during the epidemics of the last twenty or thirty years, and there is a pretty general concurrence in the belief that the population, *during* the *summer*, amounted to at least...........125,000.

Mortality by yellow fever.

The total mortality, from *yellow fever*, during the year, not only those certified to be such, but a large proportion of the "unknown," *supposed* to be such, from a want of proper records; it is estimated, upon all grounds of probability, to be................. 8,101.

Ratios to the different populations.

The ratio of *mortality* from *yellow fever*, to the entire *permanent city population*, being the calculated natural increase over the census returns, is 1 in 19.02, or [per cent.] 5-25.

The ratio of *mortality*, to the population supposed remaining in the city, or *exposed*, is 1 in 15.43, or..... 6-48.

The ratio of *mortality* to the population estimated *susceptible, or unacclimated*, (60,000,) is 1 in 7.40, or.. 13.49.

And the total mortality of the year, to the total known permanent population, after deducting all other causes of mortality than *disease*,* was 1 in 10.19, or.. 9-80.

And including all causes of mortality, 1 in 9.76, or 10.23.

To arrive at the number of *cases* of yellow fever which occurred during the year, the details are more precise than have ever been attained here before, but still far from perfect, owing to the backwardness in the faculty reporting their cases.

The reliable returns are derived from the following sources, viz:

	[Cases.]		[Deaths.]		[per cent.]
There occurred at the *Charity Hospital*,..........	3312,	of which,	1890,	being	58-84.
The *Howard Association* had, *besides* 429 in the Touro Infirmary, and about half of those in the four Board of Health Infirmaries........	9353,	"	2252,	"	24-09.

* Deduct from the aggregate, Table F, the following causes of deaths, *not from disease*, viz: "non viable," 13; "still born," 346; casualties, 61; drowned, 105; burns and scalds, 18; hydrophobia, 6; poisoned, 4; wounds, 47; suicide, 14; old age, 5; treatment, 3: (to which ought rightly to be added, intemperance, 123; although I refrain,) amounting to 67[illegible], or about $4\frac{1}{4}$ per cent. of the whole mortality, and reduces this to 15,117; and the ratio of mortality will be as above.

I have not made this correction in Chart A, for previous years, because I had not the materials. The deduction would have, doubtless, been much larger.

		[Cases]		[Deaths]		[per cent
Cases, mortality, and ratios in various public institutions.	The *Touro Infirmary*, of Howard 429; others, 94,..	523,	of which	213,	being	40·72.
	The *Maison de Santé*,..............................	338	"	97,	"	28·69.
	The *Luzenburg Hospital*,..........................	150	"	79,	"	52·66.
	The *Board of Health* and *Howard Infirmary*, No. 1,	343	"	155,	"	45·18.
	" " " " " No. 2,....	338	"	170,	"	51·18.
	" " " " " No. 3,....	1500	"	500,	"	33·33.
	" " " " " No. 4,....	432	"	207,	"	47·91.
	The *City Workhouse*, 1st District,.................	89	"	14,	"	15·73.
	The *City Prison*, 2d District,......................	30	"	5,	"	16·16.
	The *Lunatic Asylum*..............................	9	"	0,	"	00·00.
	The *Boys' Orphan Asylum*, 4th District,..........	60	"	2,	"	3·33.
	The *Boys' House of Refuge*,......................	21	"	6,	"	28·57.
	The *Girls' House of Refuge*,......................	21	"	1,	"	4·76.
	The *Catholic Female Orphan Asylum*, Camp st...	81	"	4,	"	4·93.
	The *Poydras Female Orphan Asylum*,............	50	"	9,	"	16·20.
	The *Circus Street Infirmary*, no returns, but estimated about..	300	"	100,	"	33·33.
	To which add, of cases reported to me, and called "outside cases," by members of the Howard Association, and other philanthropic individuals, and supposed same rate of mortality as the Howard's *public practice*,*......	2929	"	705,	"	22·02.
Ratios.	Making the total of *eleemosynary cases*, or at..... per cent. or 1 in 3.03.	19479	"	6409		equal to 32,90
Number of cases in private practice.	From various members of the faculty, in the city, whose names are mentioned hereafter, I have had reported to me, localised,.................	7624.				
	From the best estimates the Sanitary Commission is able to form of the location, practice, and number of those who have not reported, it believes they do not exceed..................	1917.				
Total ratios.	The total, then, in *private* practice, to which must be debited the balance of the mortality from yellow fever, amounts to........................ per cent., or 1 in 5 89.	9541	"	1691		17·72
	Making the total number of *cases* in the city, during 1853,................................ per cent., or 1 in 3.58,	29,020	"	8101		27·91

This is the largest number of cases, and the greatest mortality from yellow fever that ever afflicted our city. But it is the least mortality to the number of cases that has ever occurred in a great and malignant epidemic yellow fever,

* These were all attended by physicians of this city, almost entirely without remuneration, and it is but bare justice to them to say, that they were ever, at the call of duty and humanity, making every sacrifice at the noble shrine; and that, when the epidemic slackened in its virulence here, they generously volunteered to pursue the scattering pestilence into the interior, in aid of their less experienced brethren and suffering fellow citizens. It is with pride we record that no one proved recreant and deserted his post, and that many (fourteen) fell victims to their high professional honor and devotion. Nor was the other branch of the profession less distinguished in the call of duty, and suffered still more in obeying it; more than thirty apothecaries having sunk under it.

such as this was, and it is but fair to claim for our faculty and philanthropic associations, unequalled skill and kindness, in the treatment of the greatest scourge of our country, as I shall presently show. It is but a faint tribute of praise, due to the warm hearts and open purses of our countrymen, in other sections of our happy union, to acknowledge that much of this proceeded from their kind aid, in the deepest hours of our travail we saw that our calamity was felt with electric speed every where, and that relief, accompanied with warm sympathy, came, even beyond our wants; which was then as liberally distributed to our suffering fellow-citizens elsewhere.

Tribute to the faculty; our associations and friends abroad.

Now, thoroughly to understand our relative *status* to other places, and it can only be done by comparison, let us *en passant*, cast a glance at the sufferings from this disease in other cities and countries, not that it makes our misfortunes any the less. but it is consolatory to know, that other cities have suffered as much or *more* than we have, and are *now enjoying* the blessings of health. It will be made probable that we might, by similar means, do so also, *and it is for that purpose, mainly*, that *I make this comparison.*

Why compare with other cities.

Mortality of epidemic; Yellow fever in Philadelp'a in '93-'97-'98.

In PHILADELPHIA,		in 1793, the ratio of mortality to those exposed or remained, was	1 in 10
		and the ratio to the entire population	1 in 13
do.	do.	in 1797, the ratio of mortality to those that remained,	1 in 16.6
		and to the entire population	1 in 50
do.	do,	in 1798, the mortality to the entire population was	1 in 15.50
		and to the number exposed	1 in 6
The three epidemics of the same city, for 1793, 1797 and 1798, gave an		average mortality of the entire population of	1 in 14.24
		and of those that remained in the city, of	1 in 10.13
And the mortality to the cases attacked in the epidemic years, from 1793		downwards varied from 1 in 1.2, in 1819 to 1 in 3.86 in 1805, giving an average for all these epidemics of	1 in 2.12

Average hospital mortality.

The loss at the Hospital alone during the epidemics of 1793, 1797, 1798, 1799, and 1802–'3, the only years in which the admissions were recorded, varied from 1 in 1.68 (1799) to 1 in 2 (1803,) with an average for the six seasons of 1 in 1.867.

In these several attacks of epidemic yellow fever in Phila-

Where most fatal. delphia, it was remarked, that it was much more fatal in the low filthy malignant atmosphere of some districts, than in those where they were more elevated and airy—in those in wooden houses than in those of brick. This is found to be the case every where.

In New York, Baltimore and Charleston. The general mortality to cases in NEW YORK, was about 1 in 2; in BALTIMORE, 1 in 2.87; in CHARLESTON, about 1 in 4 of the cases fatal, on an average of the several authorities. In Savannah the number of persons dying of autumnal diseases to the whole white population was in 1817, 1 in $9\frac{2}{3}$, and in 1820 1 in 5.1–10. In Natchez, on an average of a number of years, the mortality to cases was 1 in 2.13 and 1 in 16 of the population. In Mobile, 1839, and 1847 the average mortality to cases, was estimated at 1 in 7. The mortality to the cases in the epidemic here of 1820, was 1 in 6 in adult whites, in various description of persons; as women, children, blacks, 1 in 10. Mortality in New Orleans. The average in New Orleans in a series of years to 1849, the mortality was 1 in 4, this, however is taken mostly from the Hospitals, in private practice about 1 in 8 or 9, and the proportion to general population as 1 in 55. From an estimate I made some years ago, from the results in private practice, there is some difference from those above, which are obtained with the preceding interesting historical statement, from the reliable authority of Dr. R. La Roche, in Philadelphia, mine made the mortality in private practice to vary from 1 in 10 to 1 in 20, while those in Hospital did not vary greatly from those in our public institutions last year, with the exception of being from about 10 to 15 per cent. less. During the late epidemic, the statements, as usual, were conflicting and imperfect—no estimate that is entirely reliable can be formed of it. in private practice; I have averaged it at 1 in 5.89, it is impossible from obvious circumstances, to arrive at the exact truth, it no doubt varied from 4 to 50 per cent.

During 1804, not less than twenty-five cities and towns were visited by the fever, in *Spain*; the population amounted to four hundred and twenty-seven thousand two hundred and twenty-eight, of which fifty-two thousand five hundred and fifty-nine, or 1 in 8.12, perished. In fourteen of these places, at different periods, the mortality, in proportion to the population, was 1 in 6.42; the extreme being 1 in 2.25, and 1 in 13.3. In seven places, the proportion of persons affected, amounted to 1 in 278 of the population; the extreme being 1 in 1.18, and 1 in 5. In twenty-one, the average proportion of deaths, to the number affected, was 1 in 3.087; the extreme being 1 in 1.3, and 1 in 6.42. While two hospitals gave a mortality of 1 in 2.15 of the number admitted, with extremes of 1 in 11, and 1 in 282.* In Spain.

In the *West Indies* it is often difficult, as it is here, to obtain exact records; the public and private practice being so different. In the government military hospitals, in Cuba, the mortality from yellow fever is very small, not exceeding often, (if the statistics, as published, can be relied on,) two to five per cent.; while in the hospital for the reception of the poor, it is very large, as large as any where. In the West Indies.

In *Vera Cruz*, the mortality in private practice is very small; the treatment being very mild and simple. While in the military hospitals, with the Mexican soldiers coming from the *tierras templados i frias*, (upper country,) it is frightful; sometimes nearly the whole dying, and the whole per centage is that of escape, which is very small! The filth of the hospital, and intemperance of the men, being very great. The details will be given hereafter, when we come to show the influence of sanitary measures upon it, and the comparison of other Southern cities with New Orleans. At Vera Cruz

In Rio Janiero, from the highly valuable information the Sanitary Commission has received direct through the United States Consul, Robert G. Scott, Esq., (who has sent many valuable documents; see proceedings,) exhibiting a remarkable proof of the protection, and assimilative influence of climates, on these diversities, all exposed for the first time to this (then) new malady—affecting them respectively as follows: Ratio of mortality of different classes at Rio.

* Dr. La Roche.

	per cent.
On native Brazilians, about	2
On negroes of recent and former importation, from	$1\frac{1}{2}$ to 2
On acclimated, (to that country,) Europeans,	5 to 6
On the unacclimated and sailors, a mortality of about	30

Mortality in the interior.

In the interior towns of this and the adjoining states, the mortality to the cases, as also to the population, was, last season, much larger than in this city, many villages being more than decimated of their population; of the mortality to cases, probably nearly half dying, in many places. This can only be accounted for by a want of familiarity with the disease, and not having proper nurses. In this city, where these exist, it is probably as successful, in the *same description of subjects*, as it is any where. In Havana and Vera Cruz, with a Spanish and Mexican population, and from the South of Europe generally, whose inhabitants are not given to intemperance, the mortality is very small. Indeed, with them, it is not considered the most dangerous form of fever, nor can it hardly be deemed so here, in good subjects, with proper care and attention.

Great mortality from yellow fever abroad.

Professor Dickson, says; "Yellow fever must be viewed as one of the most destructive forms of pestilence, exceeding even the plague perhaps, in proportion to mortality. In 1804, in Gibraltar, out of a population of nine thousand civilians, but twenty-eight persons escaped an attack, and the deaths amounted to more than one in three. Musgrave gives a scarcely less terrible account of it in Antigua, in 1806. In Jamaica, under the care of Dr. Hume, three out of four died of it. In the city of Philadelphia, in 1820, there died eighty-three out of one hundred and twenty five, about two out of three." During the late outbreak of the yellow fever, in Philadelphia, there occurred one hundred and twenty-eight deaths, out of one hundred and seventy cases, in public and private practice, making a mortality of 1 in every 1.48, or seventy-five per cent.

It will be apparent from these statements, that yellow fever is a much more fatal disease in Northern than in Southern climates. The subjects differ as much as the treatment and the climates.

SECTION V.

Epidemic Constitution—Its Constituents—Proof—Influence on Vegetable and Animal Life—Meteorological Elements—Terrene do.—Difference of an epidemic from an Endemic—An Epidemic cannot be Imported—Epidemic requires localising causes for its development.

Having thus shown the special medical constitution and of its disastrous influence on man—and contrasted its effects here with what it has displayed, not only in various parts of our own country, but throughout the yellow fever zone; we now proceed to approach it a little nearer and ascend to its *causes.* Let us scrutinize these, as well general as local, that we may thoroughly understand our *status*—the *principle upon which it depends for existence,* and by a practical application draw useful lessons from it,

Division of the subject.

I proceed then to exhibit the evidence, which proves, first, that a great epidemic constitution, or what has been denominated "epidemic meteoration," existed; and secondly, what, were the probable causes or CONSTITUENTS of it.

Epidemics formed of certain constituents.

We have evidence of the existence of a great epidemic yellow fever in 1853, not only over the city of New Orleans, but over a large portion of the Southwestern part of the United States; from its effects on nearly all the forms of life, animal, as well as vegetable; that there were some vast influences let loose or developed, or some apparent irregularity in the ordinary elements of existence, that was at war with its being, that is essential to be understood, in order to derive the necessary aid to counteract or control them. It is of vast practical value then to know the CONSTITUENTS which composed it, if they be susceptible of analysis, for it may be considered a settled opinion with all intelligent men, that *epidemics derive their power and spread themselves* from certain *unusual circumstances* *and conditions*, that these are required to give them activity, and the important fact is clearly inferable that being the *sine qua non*, THEY FORM THEM. This, in the nature of things, from its wide pervading, direct and almost immediate influence over an extensively spread population, must be atmospherical, and we state them, en passant now, to be more specially mentioned hereafter, that the admission of this principle—the admission of a wide-spread *atmospherical element as a necessary constituent, draws after it an important, if not inevitable inference, in its being a conclusive answer to all averments of its contagious qualities!*—not that a contagious disease cannot become epidemic (although it is very rare), but the difference is, that a contagious disease *never looses that quality, and epidemic disease does, directly it is removed out of the sphere of the epidemic atmosphere*, which always has bounds and limits, however extensive it may be, and beyond the influence of the localising conditions which will be pointed out hereafter. The testimony in support of this, which the Sanitary Commission has obtained, has been most ample and conclusive. We make it as our offering to the vast proofs with which medical record abound on this important subject.

If epidemic, not contagious.

Proof of an epidemic atmosphere.

An epidemic disease is known to prevail when a large number of cases of disease, of the same type and character, break out, either simultaneously, or within a brief period, over a considerable extent of a city or country, *wearing one general livery, and evincing and maintaining a sway over all prevailing diseases.* The statement of this proposition, is to carry conviction of its truth to all those who witnessed the characteristics of the disease last summer, when forms of morbid action, that were not suspected to be yellow fever, from wanting its prominent symptoms, were suddenly terminated by black vomit. Indeed, so fatal was its influence in many cases, that nearly, and in some cases all its stages, were merged in the last and unequivocal one—the fatal black vomit, as a child in the nurses arms, in others, in a vain attempt at vital re-action, the system sinking in the effort within twelve hours;

so virulent the poison, so futile the recuperative principle. The general uniformity of its type, its speedy prevalence over the entire city, breaking out in distant and disconnected parts at the same time, and by-and-bye, extending over its entire area, and thence, as we shall see, to different parts of the country, not immediately, even in those having hourly communication with the city, but many weeks afterwards, as the combined principle (meteorological and terrene) became matured and extended, with a greater or less prevalence and intensity of the *localising* causes, to be mentioned hereafter. Farther proof.

It is farther proved from its reaching insulated places, as jails, penitentiaries and lock-ups, heretofore exempt. Even insulation on a plantation did not always exempt the inmates; in the tardiness and great length of convalescence (taking about double the usual period,) the great liability to relapse, from the deficiency of re-action in those that continued in the epidemic atmosphere, and the rapidity of restoration on a removal from it. Do.

Hence then the atmosphere constituted wings for the propagation of the general epidemic and localising conditions gave it a habitation in various places.

What is meant by an epidemic atmosphere then, is the presence of certain elementary constituents or their combination different from the habitual or normal condition. We shall essay hereafter to state, in what these consist. We have no proof of anything *specific*, beyond this combination, and this is *two-fold*, the meteorological part probably forming the predisponent, is innocuous without the other, it is but one blade of the "shears," the second is the local circumstances and influence — the true localising or fixing power. It is what has been denominated by high authority, *"the test and touchstone of poison"—that produces its development whether acting on individuals or communities, filth in every kind, degree and sense, represents our meaning. For an atmosphere to prove epidemic pre-supposes the pre- Epidemic atmosphere. What.

* Mr. Simon.

sence of both. If there is only one of them present, (and either one of them is the same) the effects do not take place. If a case is carried from an infected locality to one that is pure, it does not spread; but if conveyed to a place where there exists an impure, kindred or infected atmosphere, the disease is propagated, and it seems, to the surperficial observer, "contagious," and hence arises the establishment of one of the great "false facts" in physic, and the foundation for endless, but ridiculous controversies to the disgrace of science and the injury of humanity. Instances corroborative of each of these conditions, are furnished in another page. The special characteristic attribute of contagion is that it is irrespective of external conditions; it pays no respect to climates, zones or seasons; it requires no special atmosphere—it yields to none; it is self-propagative and progressive, and dependant upon its own creative and self-sustaining powers. To *none of these has yellow fever any similitude.*

Its great value.

Contagion independent of external circumstances.

Certain atmospheric appearances have been often observed here, during the cholera epidemics of 1832 and 1833. The dark murky "cholera cloud," as it was then denominated, hung over our devoted city, like a funeral pall, as long as the epidemic continued, and struck every heart with dismay. The experiment with meat, has been often tried during a cholera epidemic, and it usually became putrid, if somewhat elevated in the atmosphere, and filled with animalcules. This, however, is believed not to be remarkable, as it would take place at any season. It was observed here last year that butcher's meat became earlier tainted in the stall than usual. Birds and beasts have been driven from their usual haunts, into the deepest recesses of the forest, showing by their instincts that they were sensible of some malign properties existing in the bosom of that atmosphere whence they derive their main vital influence. At Lake Providence Judge Selby noticed that the feathered tribe almost entirely disappeared during the prevalence of the epidemic. In a former outbreak of cholera, on the "coast," it was observed

On vegetable and animal life, formerly.

Soon tainted butcher's meat.

Birds driven away, and killed.

that the carrion crows ceased to make their appearance, although there were plenty of dead cattle exposed in the fields. An unusual influence on animal life has been often remarked during the existence of cholera here. In Spain, so malign has the air been sometimes found during the existence of yellow fever, that birds confined in their cages have died. The older records in our profession, of periods when epidemics raged with one hundred-fold more violence than they have done in later times, almost every species of animal life suffered—nor do I know of any reason for the comparatively lesser influence of epidemics of latest, over ancient times, than the extension of the comforts of life, and the refinements which civilization has wrought, which, really, are nothing else but sanitary measures.

Its influence on animal and vegetable life in the neighborhood

Nor are we without evidences of the extension of such influence to the vegetable creation. During the late visitation, Mr. Lawrence, who is engaged largely in horticulture, in the lower part of the city, informs me that his garden seed would often fail to germinate, but still more often, when they would sprout up a few inches from the soil, a sudden blight would seize them, and in a few days they would wilt and die. This was eminently the case with the cauliflower, the celery, the cabbage, raddish and other vegetables. To keep up his stock, he, in vain, applied to his neighbors, to those on the opposite side of the river, and down the coast. The same influence had been extended to them. Many of his fowls died, old and young, without previously appearing sick. These effects only continued during the epidemic. In other parts of the country similar effects were produced in the destruction of the various kinds of poultry, in the tainting and destruction of orchard fruit, and a blighting influence of various forms of vegetable life; and on the coast of Texas the fish were found dead in immense quantities, as reported to the Sanitary Commission, viz:

Epidemic influence on fish on the coast of Texas.

Biloxi.

At Biloxi, the peaches rotted on the trees; great mortality existed among the fowls; flies and musquitoes remarkably numerous; mould on the trees; heat unusually great; thermometer 94°; two earthquakes during the season; many cases of yellow fever, without personal intercourse, with any sick of the disease.*

Bay of St. Louis. *At Bay St. Louis*, there was an epidemic among fowls.

Bayou Sara *At Bayou Sara*, the China trees had a sickly appearance and their leaves covered with a crustaceous larvæ.†

Centreville. *At Centreville*, musquetoes and flies more numerous than ever observed before; and mould of a drab color, and very abundant; season unusually wet, and heat of sun *very* great.‡

Clinton. *At Clinton*, musquetoes uncommonly numerous night and day.

Baton Rouge. *At Baton Rouge*, "fruit of the peach full of worms, and potatoes rotted in the ground."

Lake Providence. *At Lake Providence*, "fowls very sickly and many of them died; animals and plants sickly—many had bumps upon them; musquetoes tenfold more numerous than ever known before; never saw one-twentieth part of the mould; toad-stools vastly more plentiful than heretofore; a peculiar smell pervaded the atmosphere of the place." §

Port Gibson. *At Port Gibson*, dark and unhealthy spots on the peaches; bright and bluish mould very common on the grain. Dr. McAlister writes that during eighteen years of close observation, he had never seen such repeated floods, attended with such an excess of thunder and lightning, succeeded by such hot sultry days, during the latter part of the summer. The city occupies a level locality on a rich alluvial soil, and presented during this time, the appearance of a marsh.

Natchez. *At Natchez*, epidemic among poultry (fowls); musquetoes very numerous, and the epidemic particularly severe with pregnant women.‖

At Washington. *At Washington, Miss.*, epidemic among poultry (turkeys) taking off entire stocks, without apparent cause; their livers found greatly enlarged and diseased.¶

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* Drs Byrenheidt & Cochrane † Brown. ‡ Dr. Wood.
§ Judge Selby. ‖ Dr. Davis. ¶ Prof. Wailes.

At Gainesville, fruit rotting prematurely and extensively; native cows dying in great numbers, without obvious cause. At Gainsville.

But fortunately for the interest of truth, the recent progress of science has not even left this hitherto dark corner, without other rays of light, with which to illuminate it. The Smithsonian Institution, in the noble language of its founder, established "to extend knowledge among men," is spreading the enlightening rays of science over every region of our country. I am indebted to the kindness of Professor Blodget of that valuable institution, who has most obligingly answered the queries I have addressed him upon the subject, for the subjoined information, containing direct and conclusive proof of an *epidemic atmosphere*, showing, most satisfactorily, that wherever the epidemic influence was felt by man, *there* was *exhibited proofs through meteorology*, of the existence of that atmosphere, that this prevailed to a most remarkable extent, that, notwithstanding the advanced period of the season and the presence of a remarkable elevation of temperature—*that* is proved not to have been a sufficient meteorological ingredient to constitute the epidemic constitution, and that the disease did not become developed until there was superadded to this, *high saturation*, affording demonstrations upon the subject, it is believed, never exhibited before.

LETTER FROM PROFESSOR BLODGET.

"*The Temperature Comparisons.*

"The comparison of mean temperature, at various stations embraced in the district over which the yellow fever extended at sometime during the summer, with the mean for a series of years, or for 1852, shows, on the whole, a greater number of negative than positive differences. Yet the inferences, supported by the first view, of a colder or less tropical summer temperature, are the reverse of truth, as may readily be shown. The daily curve of the temperature is much less sharp in the rainy summer of the tropics, than in the latitude of New Orleans, in usual seasons. When, therefore, a temporary institution of this rainy and humid tropical summer occurs in these latitudes, the mean temperature deduced from the usual observations is too Information of epidemic influence from Smithsonian Institution.

Rainy season depresses the midday temperature, and elevates the morning and evening.

low, and the true mean, also, lower than usual. Thus, in the rainy season of Central America, the mean for July descends to 77°, deduced from the usual hours; while in Texas, it rises to 85°. At Fort Brown, on the Rio Grande, July, of the present year, was dry and healthy. In August the tropical rains set in, and, with the same morning and evening temperature, the midday mean fell from 92° to 88.7°. The same result occurred at New Orleans, in the contrast of June and July, in a still more decided manner, the morning mean rising, in July, 2.5° above that for the same hour in June, and the midday mean falling 2.5° below that of June. The daily curve, from minimum to maximum, was thus diminished during the rainy month of July 5°, and was actually but 4.4°, an unprecedented low, and peculiarly tropical curve.

Tropical weather in New Orleans, in 1853.

"Comparison of all the stations here given, in this manner, would prove the apparent low temperatures they exhibit, to have been *the institution of conditions approaching the tropical climate more nearly than in any year of which we have precise record.*

And extended throughout the stations.

"In further proof of this position, the great and general heats of the summer on this continent may be cited. A change of ten degrees of latitude, Southward, would give about the precise measures of temperature and humidity actually experienced on the continent. With this general accession of temperature, the humidity, and sanitary consequences, follow inevitably.

Equal to a removal 10 deg. farther South.

Rains as shown by the Table.

"The amount of rain, as a rude measure of humidity, is given at several stations, in comparison, also, with the means of a series of years.

"Frequency of rains is next to amount; and in the present case is particularly important. The stations are thus distinguished in connection with the tables of amount.

Frequency of rains, next to amount, evince tropical conditions.

"To group the results: South Florida only was profusely rainy in June, except for the last half of the month, when New Orleans became remarkable for frequency of rains. In July Texas was very dry; New Orleans the reverse, with tro pical frequency of rains. In Northern Florida and South Carolina the rains were heavy, though not unusually frequent. In August the tropical rains of New Orleans continued, and began at the close of the month in lower Texas. In September they spread over the Gulf coast East and West of New Orleans, and diminished at that point. In October they were continued on the Rio Grande, and at Bermuda, and other islands, and over most of the Gulf coast also.

Rains and fevers cotemporaneous.

" *The yellow fever began on the Rio Grande with these rains in August, and continued till they ceased in October! It began in other parts of Texas with the same conditions, and so at Mobile, continuing with their unusual continuance.*

In Texas and Mobile, fever and rains simultaneous.

Humidity.

" The mean humidity or per centage of saturation, is given for the observed hours, and for the mean of the whole month at several stations in the South and West. June is seen to have a low fraction of saturation in all parts of the United States, *except at New Orleans,* where, with a temperature 3° above the mean, the saturation was unusually high. In July the fraction of saturation at New Orleans largely exceeded that at any other locality observed, Savannah, Ga., approaching it most nearly. In August it was largely increased at all stations; in Texas and at Savannah becoming nearly as great as at New Orleans in June. In September it was slightly less at New Orleans, and greater in Texas, and Eastward from New Orleans, at Mobile, &c. October had mainly a high temperature and high fraction of saturation."

Simultaneous occurrence of the fever with high saturation and elevation of temperature.

For proof and illustration of these positions, reference is made to the tables J, K, L, and M, subjoined, containing records of temperature, rain and humidity, throughout and beyond the epidemic region of last year, and the averages of other years, with which to compare it. The whole is most conclusive.

TEMPERATURE, RAIN, AND HUMIDITY, OF SAVANNAH, PENSACOLA, AND JACKSONVILLE, 1852—53.

	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec,
MEAN TEMPERATURE.												
Savannah,...1852....	.....	.....	.....	.....	73 04	75.44	79.98	77.84	74.47	.....	.....	....
" " 1853....	47.88	54.40	59.50	68.11	74.00	79.00	81.50	79.33	75 83	64.50	60.40	48.40
Jacksonville, 1853....	.....	.....	.....	71.86	77.29	78.89	81.74	82.56	77.55	68.92	64.28	53.45
Pensacola,...1852....	.....	....	....	.....	75.67	78 00	.....	81.00	78 00	.....	.....	.....
" " 1853....	51.33	57 04	63 58	69 67	74.25	80.22	82 08	82 38	78.42	69.56	65.67	54 94
AMOUNT OF RAIN.												
Savannah....1852....	.....	.....	.....	....	8 721	9 310	5 324	5 040	4 673	....	.....	.....
" " 1853....	1.147	1.142	2.479	0.444	3.959	0 787	6.464	8.168	9.427	2 888	3.096	6.882
Jacksonville, 1853....	.....	.....	.....	0.465	1.530	3.240	7.400	2.700	9.675	9.350	2.275	3.618
Pensacola,...1852....	.....	.....	.....	....	4 862	0 833	.....	14.000	0 500	.....	.....	.....
" " 1853....	3 250	4 062	2 562	0 500	0.200	0 937	2.531	1 562	14.781	5 500	1.000	1.969
MEAN PER CENTAGE OF HUMIDITY.												
Savannah,...1852....	.....	.....	....	....	.740	.752	.787	.800	.818	.....	....	.....
" " 1853....	.658	.677	.690	.617	.690	.707	.773	.7	.793	.737	770	.710
Jacksonville, 1853....	.....	.....	....	.....	.....	.826	864	.840	.871	.....	....	.....

TABLE J.—*Mean Temperatures for* 1853 *in Districts in which Yellow Fever at same time prevailed—And a Comparison with a mean of years, or with the year* 1852.

	JUNE.	JULY.	AUG.	SEPT.	OCT.
Charleston,—Ft. Moultrie.......	78.48	82.85	80.08	76.83	65.69
....	+0.1	+1.5	—0.2	+0.7	—1.5
Savannah,....................	79.00	81.50	79.33	75.83	64.50
....	—0.4	+0.2	—1.0	—1.1	—2.7
Whitemarsh Is'd,...............	77.40	80.92	78.65	74.85	63.74
....	+1.1	+1.8	—0.4	+1.0	—2.2
Jacksonville,..................	78.89	81.74	82.56	77.55	68.92
..............1852	80.00	82.92	82.37	76.47	71.59
Key West,....................	80.50	83.42	83.97	—	80.27
....	—1.4	—0.2	—0.6	—	+2.0
Ft. Brooke, Fla,................	78.56	82.15	82.23	80.20	75.00
....	—0.8	—1.7	+2.0	+2.7	—0.9
Ft. Meade, Fla,................	75.53	79.00	78.20	79.93	73.01
....	—3.7	—0.8	—2.6	+2.0	+0.0
Cedar Keys,..................	80.11	83.18	81.98	79.37	71.94
....	+1.5	+2.7	+1.3	+0.6	—1.2
Pensacola,....................	80.22	82.08	82.38	78.42	69.56
....	—0.4	—2.8	—1.1	—0.5	—1.5
New Orleans,.................	80.38	80.24	79.60	75.89	—
....	+2.2	—0.1	+0.0	—1.2	—
Austin,......................	80.81	82.00	81.01	76.77	66.65
..............1852	79.37	—	83.83	75.71	69.43
New Wied,...................	80.80	82.00	81.00	76.80	
..............1852	79.25	82.75	83.75	75.75	68.75
Fort Brown,...................	82.08	84.18	82.88	78.41	71.88
....	+0.4	+0.8	—1.8	—2.0	—2.1

TABLE K.

Weather at various Stations during the Yellow Fever months of 1853.

	JUNE.	JULY.	AUGUST.	SEPTEMBER.	OCTOBER.
Charleston, Fort Moultrie,	Dry	Last half showery	Very showery.	He'vy sho'ers.	Usual
Savannah,	Very dry	Showery	Very wet	1st half very wet	....
Jacksonville,	Dry	Very showery.	Usual	Very wet	....
Bermuda,	....	....	....	....	....
Key West,	Very wet	Showery	Showery	....	Dry
Fort Meade,	Showery	Very showery.	Showery	Showery	Frequnt showers
Fort Brooke,	Wet	Very showery.	Showery	First half showery	Few showers.
Cedar Keys,	Dry	Very showery.	Showery	1st half very wet	....
Pensacola,	Dry	Usual or dry	Usual or dry	1st half very wet	....
New Orleans,	Last half showry	Very wet	Very showery.	1st half very wet	....
Austin,	Usual	Dry ex. last five days	Humid, few showers	1st half wet, 2d do humid	....
San Antonio,	Usual	Dry	Usual	Usual	....
Fort Graham,	....	....	....	....	....
Fort Brown,	Dry	Very dry	1st half dry, 2d " wet	Constantly showery	Constantly showry

TABLE L.—*Amount of Rain at Stations at which Yellow Fever prevailed, for the Summer months of* 1853, *and in comparison with a mean of several years.*

	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Charleston, Ft. Moultrie	1.550	10.880	2.200	8.100	4.050		
	—2.8	+4.4	—5.0	+2.5	+1.5		
Savannah	0.787	6.464	8.168	9.427	2.888		
	—7.2	—3.2	—1.2	+4.9	—0.3		
Whitemarsh Island, Ga.	1.280	5.280	5.580	13.200	3.240		
	—3.0	+1.2	—0.2	+10.4	+2.1		
Cedar Keys	3.262	11.437	3.625	15.437	4.600		
	—1.9	+2.0	—4.0	+9.1	+1.2		
Key West	18.110	2.330	5.020		1.690		
	+14.6	+0.0	+1.7		—1.5		
Ft. Brooke, Fla.	9.090	4.120	4.670	4.360	1.700		
	+2.4	—7.0	—5.8	—3.9	—0.8		
Bermuda 1853			3.510		6.690	11.630	11.340
1852			7.000		4.260	2.400	2.980
Ft. Meade, Fla.	3.540	4.520	3.390	2.120	0.310		
Pensacola	0.937	2.531	1.562	14.781	5.500		
		—6.1	—7.1	+12.1	+2.0		
New Orleans	1.712	11.508	6.280	4.948			
	—3.7	+5.0	+0.8	+1.0			
Ft. Brown, Matomoras	1.700	0.000	3.100	8.000	7.750		
	—1.0	—1.8	+1.2	+3.3	+2.8		

TABLE M.

Humidity, or Fraction of Saturation at the Hours of Observation, and the Monthly Mean at Various Stations for the Summer of 1853.

	June.				July				August.				September.				October.			
	7	2	9	Mean	7	2	9	Mean	7	2	9	Mean	7	2	9	Mean	7	2	9	Mean
Richmond, Va.,	....	....	....	.597	....	....	....	.722	....	....	....	(R.) 700	....	....	....	750	....	....	....	....
1852,	6 .741	2 429	10 743	637	6 .851	2 540	0 823	738	6 935	2 654	10 931	840	6 .948	2 517	10 875	790	....	....	....	....
Savannah, Ga,	.770	550	800	707	860	630	830	773	900	690	860	817	890	.640	850	793	.830	580	800	.737
1852,	6 857	2 584	·0 806	752	6 .902	2 615	10 .847	787	8 883	2 603	10 835	800	6 907	2 673	10 .868	818	6 .879	2 541	0 829	750
Culloden, Ga.,	.710	423	561	565	863	591	762	736	830	622	784	745	845	..	802	763	.817	587	731	712
Eutaw, Ala,	695	456	716	623	815	626	885	775	871	688	950	838	....	664	....	....	....	....	....	....
New Orleans,	907	650	876	811	895	.707	918	840	944	805	907	885	930	671	.910	852	....	....	....	....
1852,	S. R. .938	3 639	....	789	951	.728	..	840	S. R. 910	3 677	..	809	S. R 954	3 676	....	815	....	....	....	....
Austin, Texas,	723	446	849	673	782	.550	798	710	814	501	890	.735	840	525	.868	744	....	....	....	....
1852,	S. R .899	3 493	....	696	S. R .854	3 .448	....	651	S. R. 832	3 380	....	656	S R 892	3 547	....	720	....	....	....	....
Lebanon, Tenn,	.632	.373	622	.543	699	.455	741	632	....	....	....	....	....	....	....	....	....	....	....	....
1852,	6 806	2 438	10 740	662	6 835	2 .419	10 692	648	6 862	2 556	10 774	719	6 858	2 527	10 775	719	....	....	....	....
Glenwood, Tenn	833	485	735	684	857	566	786	703	910	651	831	797	922	664	843	810	....	....	....	....
Knoxville, Tenn.,	.805	471	767	.681	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
1852,	6 .915	2 545	10 866	.782	6 915	2 563	10 847	774	6 927	2 .575	10 886	799	6 912	2 .632	10 .873	806	....	....	....	....
Germantown, Ohio,	.760	410	730	650	.790	480	770	680	898	566	888	.784	940	640	890	820	.926	.562	841	776
1852,	6 .907	1 583	11 867	786	6 .893	2 .496	10 832	740	6 910	2 530	10 830	757	6 940	2 .604	10 903	816	....	....	....	....
New Harmony, Ia,	660	490	750	633	....	....	....	...	850	590	780	74	.880	620	860	787	....	....	....	....
1852	S. R 890	3 570	....	.730	S. R. .890	3 580	....	735	S. R 900	3 630	..	765	S R .900	3 644	....	772	....	....	....	....
Dubuque, Iowa,	721	496	745	654	.750	.501	780	680	780	520	800	700	.790	600	800	730	....	....	....	....
1852,	6 .770	2 .450	10 .760	.660	6 .820	2 .490	10 .810	.707	6 .824	2 .433	10 .779	.679	6 .820	2 .500	10 .780	.700	....	....	....	....

In comparison with 1852, and with previous years generally, the difference of hours must be taken into account. Sunrise and 6 A. M. always give a higher fraction of saturation than 7 A. M.; and the mean deducted from 6, 2, 10; and from sunrise and 3 P. M. it is always greater than that from 7, 2, 9. The precise measure of this correction has not been determined.

June, of 1853, was everywhere less humid than 1852, except at New Orleans; there its fraction of saturation was greater in 1853, distinguishing this point as reversing the condition common to most other parts of the country for that month.

July, of 1853, has a higher saturation at Austin, New Orleans, and Savannah; elsewhere less then in 1852.

In August, 1853, is everywhere of higher saturation than in previous years; and the difference is greatest at New Orleans.

September, 1853, presents the same conditions prevailing in August.

October is not sufficiently observed.

Such then, are some of the *direct* proofs furnished by meteorology, of the limits and extension of the great epidemic. It is only to be regretted that every village and hamlet in the country does not supply data of a similar character, to make the application still more precise. On a critical analysis of these highly valuable observations, it will be seen with what exact accordance they correspond with the variable outbreak of the epidemic in every part of this extended region. *In every instance where the facts are known great heat and high saturation* were the predominant conditions for the prevalence of the disease, and it was often remarked that "the *return of these conditions re-produced the fever two or three times.*" Can proof be made stronger? It will be thus seen how truthfully and philosophically this explanation comes in to substitute itself for that most unsatisfactory and barbarous one of contagion, sundering, so far as it extends its creed, every tie that binds man to man, as we have unfortunately found to be the *case* in many instances during the last season in the interior, not in this city, where the doctrine is entirely new. The inhumanity of that attribution is only equaled by its folly. If yellow fever is contagious, *it is a law of the disease,* this it must carry into all places, and under all circumstances (like small pox.) A "*contingent contagion*" is a medical misnomer, is void of a precedent, and has no parallel in the annals of the science. Every device has been resorted to in the way of experiment to show the contagious quality of yellow fever, if any existed, but have all signally failed. That it may be *infectious* under certain circumstances, is admitting nothing more than that it is caused by *impure air*, and that this air can be carried in the hold of a vessel, or any similar mode, by which the air of one place is conveyed to another, or even through clothing, (in some special cases and to a very limited extent,) is not denied. Where the above conditions are present in a sickly season or district, it sometimes requires but a slight addition for the development of the disease, and this is apparently furnished occasionally, by the arrival of cases, or vessels, or goods,

Great heat and high saturation always present

Why impossible to be contagious.

To what extent infectious

with the poisonous or infectious air; but it is not a result of *secretory* action, as all the contagions unquestionably are. This susceptibility of conveyance or transportability, exists, to a very limited extent, and only when the causes giving origin to the disease are more than usually malignant, and are *only propagated in a kindred or congenial atmosphere.* These views have thousands of times been proved by our constant experience here for more than half a century, and such, I deem it, is the general result of the experience of the profession South, during that long period, with a very few exceptions, and those mostly of the last year.

Infection not personal.

Infection is not a personal quality—it applies to vitiated air from whatever cause proceeding. It is the product, not the producer. It is the *rem.* How is it when we approach so near as to causation—to the thing—the principle—in any of the generally acknowledged contagious diseases? In small pox the smallest appreciable amount of *secreted matter* inserted into the body, at *once* and *always* produces the disease, and all these contagions have a *peculiar secretion* as a *product of the disease*, which by its specific action on the system, re-produces itself and thus propagates the malady. Is that the case in yellow fever? *All the secretions and products of the disease* have been over and over again inoculated into susceptible bodies. Even black vomit itself has been tried in every way, and all with impunity. They have been slept with, clothes used, all with the same result, and this would ever be the case, unless there should happen to be *present an epidemic, or foul, or kindred atmosphere!* Without then, this *localising condition*, the congenial materials, the disease does not spread. If it is not contagious, and it has never been found *apparently* so in this country before, then there are existing independent circumstances that account even for the *seemingly* contagious quality, and this proves the existence of the epidemic atmosphere or epidemic meteoration, and the extensive prevalence of yellow fever out of its usual bounds *is proof positive of the existence of that epidemic atmosphere,* and its prevalence and limits are bounded by it.

What is contagion.

Yellow fever not contagious.

How apparently so, explained.

Such high authorities as Drs. Haygarth, Percival, Ferrier

Carmichael Smith, Currie, Russell, Roberts, Arnott, Christison, and others in England, deny that exhalations from the living body are capable of permanent suspension in the atmosphere, or that they can be conveyed, unchanged, through pure air to great distances. They regard it as established by an indubitable body of evidence, that the moment these exhalations come in contact with the external atmosphere, they are diffused through it; that by such diffusion, their infectious properties are destroyed, and that, though when pent up in close unventilated rooms or filthy ships they may acquire some degree of permanence, much concentration and virulence, yet, when they once pass into the ocean of air, they disappear as a drop of rain in the ocean of water. These authorities, view the property thus possessed by air to neutralize and destroy these exhalations, as a provision of nature for our well-being.

No exhalation from human bodies of permanent suspension in the atmosphere.

It was further observed that if the emanations thrown off from the living body formed permanent and powerful poisons, and if this were capable of being conveyed, unchanged, to great distances, we should be able to live only in solitude; we could not meet in society, for we should poison each other; the first symptom of illness would be the signal for the abandonment of the sick, and we should be compelled by a due regard to self preservation, to withhold from persons afflicted with disease, every degree of assistance that required personal attendance.

Consequences on human intercourse, if permanent.

Forbid human intercourse.

But our physical is in harmony with our social constitution, and not in contradiction to it. The necessity of intercourse between all the members of the human family is one of the moral exigences of our race. The policy of encouraging, facilitating and fostering that intercourse among all the nations of the earth is one of the impressive distinctions of our age. "But if it be true that plague and pestilence are capable of being imported from country to country, carrying devastation in their course, and that this calamity may be prevented and can only be prevented by placing periodical barriers between one nation and another, so as effectually to obstruct that intercourse, then there is a contradiction between the necessities and obligations of the human family, and the physical laws of their being.*"

Physical in harmony with social constitution.

* Report on Quarantine—General Board of Health.

It is as true in physic as in other sciences, that "there are more *false facts* than *false theories*," and the alarm in the public mind, last year, was sufficient and did clothe this disease with qualities susceptible of explanation, much more satisfactory, of universal application, and in exact accordance with reason, science and philanthropy. There can be no two opposite facts in nature, although it may be very difficult sometimes to ascertain and establish the true one. Whenever this difficulty occurs we must apply to general principles for explanation, and have recourse to the ordinary and well known causes, circumstances, condition, and analogies, existing or applicable.

No two opposite facts in nature.

Another ground of error existed in confounding an *epidemic* with an *endemic*. The difference does not exist merely in a greater prevalence over a wider space of the former, but in a *greater intensity* of the *materies morbi*. An epidemic is a wide pervading disease, one of whose constituents being atmospheric, and therefore diffusive, influences the type of prevailing febrile maladies, and furnishes to them *a uniformity of livery*, and this will doubtless aid in the explanation why so many creoles have been affected with a fever, having so many of the characteristics of the yellow fever last year, and especially with children, who are so much more susceptible to prevailing maladies than adults. During the existence of an *endemic fever*, this does not take place, although equally and similarly exposed. The very idea of transporting *an epidemic*, which is mainly atmospherical, from one country or locality to another, is an absurdity upon its face. The very statement of the proposition, is its own refutation with intelligent and thinking men. It is little less than arrogating an attribute of omnipotence.

Difference between an epidemic and an endemic.

What is an epidemic.

The important practical deduction resulting from this, is, that *an epidemic cannot be imported*. The principle is very clear. The facts are in exact accordance. Humboldt has long since shown, that, although yellow fever prevailed among the newly arrived *every year* at Vera Cruz, it never prevailed *epidemically* there between 1776 and 1794, although the intercourse with Havana and other places, where the disease continued to pre-

Practical deduction.

Proof from Humboldt.

vail, was quite free. If a case of yellow fever proceeding from a locality where the epidemic prevails is conveyed to another, where it does not, it must terminate with the case, as has been eminently illustrated this last year, on the various marginal limits of the epidemic. This proof of epidemic influence is shown by pointing out these limits, and here it is known mainly by its wanting those evidences of its existence which proved its presence in others. Professor Blodget's interesting communication has shown, that the principal atmospherical constituents consisted in a *high saturation,* with *elevated temperature.* Now, in these places where this epidemic showed itself, and not *having the power of spreading*, there is no evidence to show that these existed, *or only one* existed. For instance, at *Memphis*, about two hundred miles above Napoleon, Arkansas, many cases, (upwards of sixty,) were carried, but with the freest intercourse, public as well as private, the disease did not spread. The place was far from clean, but there is no proof either of high saturation or elevated temperature.

No where even apparently contagious but where the epidemic principle was present.

As at Memphis.

At *Bladon Springs, Ala.*, where the sick were taken in considerable numbers, and there existed the most unlimited communication with all, yet it did not spread, and there was exhibited no evidence of the two conditions required, or either of them.

As at Bladen Springs.

At *Clinton*, near Vicksburg, the same thing happened; there was the most uninterrupted intercourse with "infected spots," persons, and goods, but there was no evidence of an epidemic atmosphere, and consequently the disease did not spread.

At Clinton.

At *Cahawba, Ala.*, about ten miles from Selma, where it prevailed in an eminent degree, and between which places there was constant uninterrupted intercourse, the disease, although freely brought there, did not spread, but terminated with the individual cases. There existed nothing unusual in the seasons.

At Cahawba.

At *Black River*, Concordia Parish, many cases of yellow fever were carried, but it did not spread. Precisely the same occurred at Waterproof, Tensas Parish, where many cases were brought and terminated without extending the disease. A like result was noted at *Point Clair*, at *Holly Wood* and at *Gaines-*

At Black River, Pt. Clair, Holly Wood, and Gainesville.

ville, and many other places, including our watering places, until an advanced period of the season, when, from the occurrence of the precedingly mentioned conditions, the disease became developed.

Proof at Trinity, La.

At *Trinity, La.*, a rather remarkable instance was furnished *of both conditions being required for effect*, for saw-dust was used to fill up low places in the streets, and even the earth dug from a foundation for a warehouse, was spread upon the streets; but there was no evidence of the existence of *the other condition*, extreme heat, direct (radiation) or indirect, or proof of unusual moisture by hygrometric tests. On the contrary, no epidemic influence noted on the fruit, "which were fine and healthy; musquetoes not so troublesome as usual; mould less than common," (proof of dry air;) no disease or fatality observed among animals." "Many cases of fever brought here, and ended without propagation, and no precaution used."*

At Portersville, cases not extend.

At *Portersville*, where several hundred people were assembled, and about one hundred and fifty in one inclosure, no cases occurred, although five imported cases were brought in, nursed by different persons, and two died with black vomit. The disease did not extend.†

In Rio. Puerto Cabello. Gayaqnil.

During the existence of the epidemic yellow fever at Rio, many persons were carried to towns at some leagues distance, but in no case did it spread. The same thing occurred in the neighborhood of Puerto Cabello, and Guayaquil. The *epidemic atmosphere* did not extend to them, and consequently the other condition was wanting.

This description of cases, circumstances, and results, could be indefinitely multiplied, not only this year, but every year of the existence of yellow fever, either here or in foreign countries.

The cause of non-communication or extension.

The explanation is so obvious, on the principles to be presently laid down in this Report, that it is scarcely necessary to anticipate them here. One of the conditions deemed essential for the existence of an *epidemic* disease is wanting; either the terrene or meteorological. The cases above given, show that

* From our intelligent communicant, Dr. Kilpatrick. † Dr. Moore.

the epidemic atmosphere was not present, and the disease did not spread. Again, a sudden change in the weather occurs, the yellow fever is arrested; multitudes of fresh unacclimated people (as we have often witnessed) rush into the city, and become exposed to the very foci where it was lately so malignant, yet not a case occurs. *The meteorological condition is wanting.* But, if the weather again becomes hot and moist, with high radiation, the disease is certain to become resuscitated. Again, the cause why *cholera* passes over one town or plantation and seizes on the next, is evidently owing, according to the most satisfactory experience in England, and what has been known to follow the disease here since 1832, in the difference in the terrene or localising conditions, (filth, disturbance of soil, &c.,) and the atmospherical being, or not, *in unison.*

It was also alleged that the fever of 1853 was different from any fever with which this city had been inflicted heretofore, and *therefore* must have been "imported" from the West Indies, Rio Janeiro, Africa, "Nova Zembla," or God knows where. This has proceeded from a patriotic, but mistaken impulse, which is pretty universal, as well among savages, as those more civilized, viz: *never to acknowledge the paternity of a pestilence!* Nevertheless, the sober dictates of truth, still more unyielding and inflexible than those feelings, compels the acknowledgement, painful as it is, that the late epidemic first commenced in this city. I have shown the folly of ascribing its origin to any foreign source, and that the appearance and symptoms of the fever, did not run precisely parallel with the yellow fever of every year, is just what might have been expected. No practical man will say he ever met with them, precisely similar in type and symptoms, at every point, in any series of consecutive years. There has been left some chasm in the similitude, some inequality in the morbid excitement. At one season, the head will be the more prominent point of attack, or onus of the disease; at another, the stomach; at another the spinal system, &c., &c., giving rise to different theories

Fever the same as in former years.

as to the pathology of the disease, requiring a modification of treatment; now blood-letting, to a great extent, general as well as local, as in the epidemic of 1833, requiring only local in that of 1839, bearing neither in that of 1841; not admitting the general, and requiring much discrimination in the local detraction of blood, last year, (in my judgment,) and in all very little medicine. These peculiarities are probably produced by variations in the remote cause, and the different conditions of the individual. Such is just the experience in other American cities. I think it is less so in the West Indies, from the greater uniformity of climate and condition there. Such, too, is the result of the experience in other diseases.

Each have their types.

All epidemics, as all other diseases, must have a beginning, a starting point. That point will be in whatever part of a city or country, in which the localising causes shall exist in the greatest excess, (as will be hereafter pointed out.) This has been clearly demonstrated, by an examination into this subject in England, where it has been made evident that while an epidemic state of the atmosphere exists over the whole country, the *disease will only be developed where* there exists *also*, in more or less *intensity*, the *localising conditions* of *filth*, moisture, stagnant air, &c., (to constitute the perfect combination.) The result of the investigations of the Sanitary Commission has, most strongly corroborated these valuable facts, and in almost every place, which they were enabled to examine personally, the causes for the localization were made apparent enough, and will be mentioned hereafter. Could this Commission have been enabled to carry out the examinations they intended, the public would have been put in possession of a still larger body of most valuable facts, to form the basis of future legislation, in this most important sanitary movement.

Although an epidemic atmosphere may prevail, disease only developed where localising conditions of filth, &c.

SECTION VI.

Two agents essential to produce an epidemic—Atmospheric and Terrene—Climate what? How far heat is productive of yellow fever—Regular progress of from the South—Yellow fever zone—Limits of the epidemic of 1853—On what dependent—Geographieal limits of fever—Humidity important element in climate—Quantity of rain not sufficient evidence of it—Error of Darby in relation to the dryness of this climate—Moisture essential to yellow fever—The great causes of our moisture—Radiation—"Yellow fever weather"—Radiation of different climates—Winds—Amount of moisture in each at New Orleans.

Having already shown proofs of the general fact of the existence of the epidemic, of its influencing the animal and vegetable kingdoms, of its extension by atmospheric and other conditions, and of the practical fact of the *impossibility of its importation*, I now proceed in more detail to specify, if not the precise elements of which it was composed, what will answer just as well for all practical purposes, the *conditions necessary for its existence*, and, fortunately for us, they can be measurably, if not entirely controlled.

Pestilences have, even to this day, been considered one of the mysteries of nature; and viewing a disease as an epidemic was deemed a sufficient answer to all inquiries in relation to its cause or nature. This does not satisfy the exactions of modern science any more than it does of the causes of tempests, storms, earthquakes, famine, and other instruments of destruction to mankind. As men were unacquainted with their causes or laws, they were denominated "accidental," although, all intelligent men now know that there can be no such thing as "chance" in the government of the world, but that there must be causes and laws of action, if we could only find them out, which is both our duty and interest. In the following pages we have attempted to analyze the METEOROLOGICAL constituents, as far as our means extended; and as it was clearly evident that these alone were not sufficient, other causes were sought out, and it was soon clearly apparent, from the facts before us, from long

Ancient opinion of pestilences.

Must be causes and under laws.

experience, from analogy, and from the records of history, that filth, impurities of all kinds, disturbances of the soil, all combined in what I have denominated TERRENE, formed an essential and indispensable link in constituting a pestilential or epidemic atmosphere.

Epidemics "shears of fate."

EPIDEMICS have been denominated the "shears of fate," the singular propriety of which I will demonstrate by interpreting one blade to consist of the *meteorological condition* and the other the *terrene, or local vitiations* to give it life, impart intensity, and produce development. Both are indispensable for efficiency. Hence then, the very natural division into

1st. Meteorological; and

2d. Terrene;

neither of which alone is competent to the production of yellow fever; the first is not a simple but compound condition, as we shall see hereafter. The second may be also. I do not propose to examine into it in this Report.

The danger is in their combination.

It is the COMBINATION of these necessary ingredients that constitutes the danger, that forms the poison and produces the element of destruction. Let us consider these separately, analyze them, see what power we have over them, so as to prevent that union which is so fatal.

The meteorology is the climate of a country.

First, of the METEOROLOGICAL: the meteorology of a city, district or country, may, without any great violence to truth, be denominated the climate of that city, &c. Its climate determines the character of its diseases, from its influence on the great law of causation, and with reference to the great principle of prevention, that is, sanitary measures, it is almost equally important. The very idea of attempting to influence these without a knowledge of its great principles to pilot and to guide us, is but groping like the blind Cyclops in the dark. This is so well understood by every scientific as well as unscientific man, that there is no description of any epidemic fever on record, of any note, in which there is not constant reference to the condition and changes of the weather as producing or influencing the disease. The testimony is overwhelming; in no postulate in medicine is there less dispute; all practical men yield it their prompt credence.

Temperature has been very properly supposed to have much to do in the production of yellow fever, and that the yellow fever zone proper, is restricted to limits where the temperature at midday, during the months of June and July is not less than 79°, and that the extent and malignancy of the disease is often in proportion to the extent in which it shall exceed that height where the other causes concur in a similar degree. That has been applied to the region as far North as Philadelphia very successfully, even during the last summer. It will not apply here with the same exactitude, because our temperature at midday is always above that point at that hour from the month of May to the month of September, nor is the malignancy of the disease in the proportion that it shall exceed that height here. The average temperature at midday of May and June preceding our epidemics has rarely been 81°88, and during the three epidemic months at the same period 83°75. The average temperature of the whole day for the three months has been 79°51. It rarely reaches as high a degree as 90° during the hottest parts of the day. M. Arejula, a Spanish physician and writer of eminence, says that under 23° Reaumur (82 Fahrenheit) it does not appear in Spain (I think.) In Rio de Janeiro it appears when the thermometer is at 77°. It is not a disease requiring the highest temperature for its development; indeed, I conceive this (or above 90°) rather unfavorable to its origination. The accompaniment of great humidity being essential, and with precipitation the temperature at once falls. The average tropical temperature of 80° of considerable duration, with great humidity, is doubtless essential to its elimination here and South of us. In Africa and the East Indies, a much higher temperature and higher combination may be the cause of its non-existence among them. So, on the contrary, a temperature above 80° is fatal to the plague! And thus, also, a temperature from 30° to 50° develops (with other circumstances, as in the other instances) the typhus gravior. Below this *fever* does not occur at all. Such are the meteorolog-

High temperature of certain duration essential.

In Philadelphia.

Temperature preceding an epidemic at New Orleans, and during it.

In Spain.

At Rio.

Above 90 deg. too high to favor its production.

Hence it does not exist in Africa and East Indies.

Temperature required for the plague.

Do. for typhus gravior.

ical limits of these great types of disease; the distinguishing characteristics of different climates and distant countries; the avenue through which one-sixth (it is computed) of those who annually fall victims to disease reach the shores of time.

Temperature alone not sufficient.

From these remarks on the influence of temperature in the production of yellow fever, it is not at all attempted to support an opinion, which, no one who has investigated the subject, believes, that elevated temperature *alone* produces it, for were that the case, it would appear annually in regions far North of us, where it is for long lapses of time an entire stranger; for we know, that extremes of summer temperature, so far from declining in proportion to increase of latitude, is just the reverse (for a certain time) and that our *extreme heat* here, is rarely equal to what it is very far North of us. Temperature, then, is only *one* of the elementary agents to aid in giving birth and activity to our formidable foe. The same may be said in relation to its decline or extinction. As it commences usually South of us, (in the West Indies, South America and Mexico,) on an average (one year with another) at least two months in advance or about May, so it retires that much earlier, and being a fever whose ordinary duration is from sixty to ninety days, usually terminates, when with us, it is at its maximum intensity. The same principle will apply with more or less accuracy, to the regions North of us. Temperature then, although a certain range and *duration*, is absolutely necessary for its origin, is not indispensable (or has little to do) for its continuance, far South of us it becomes extinct while this high range continues—ceases here usually before frost, (the supposed great extinguisher,) or continues sometime after its occurrence, and particularly has this been the case last year and more especially in several parts of the Southwestern States.

Yellow fever commences regularly from South, and proceeds regularly North.

Limits of epidemic in 1853.

The farthest North the epidemic atmosphere extended the last season has been at Napoleon, Arkansas, about 33° 50' North, and from Tampa in Florida, to Brownsville in Texas, in latitude 25.50. The yellow fever zone, so often varying, now extends from Rio Janeiro to Charleston, and from Barbadoes to Vera

Cruz. Commencing at Rio, in January, it proceeds after reaching its acme, gradually North, reaching the Northern coast of South America, in April and May, and the West Indies and Vera Cruz, in May and June, it arrives here usually the latter part of July, and does not usually reach its Northern limit until some time in August and September. In this mere historical statement, of course, it is not intended to be implied that the yellow fever is imported from the South to the North, in this regular gradation, but merely that the physical changes inviting and producing its development becomes evolved as the season advances.

Periods of its appearance in different countries.

Among these changes it is not intended to be understood that its prevalence is in proportion to the temperature existing; there are other circumstances that influence its production, among the most prominent of which, in the deadly combination, is the presence of high saturation. This is amply and beautifully illustrated in Prof. Blodget's interesting communication in another page—where high temperature long existed with entire salubrity, but as soon as great humidity was superadded, the fever was at once developed. It is difficult to say, why this two-fold combination should be essential, but in all climatural and endemic fevers, and this is essentially one, this double constituency is a *sine qua non.* This then is another proof that removes it from the category of contagious maladies, which are entirely independent of such contingencies.

Another disproof of contagion.

The zone, as now existing, is different from what it was formerly, although the temperature is about the same, the localising conditions so much under the control of sanitary measures, have, no doubt, influenced it much. Climate (that is, its power of affecting our race) is very much under the influence of circumstances, heat, moisture, dryness, its main ingredients, can be much altered (as we shall see by-and-bye,) our mode of living also influences it. If then, we can influence healthy actions, I know no reason why morbid actions should not also be influenced. In fact, we know that they may be, for I myself have remarked it, in the various changes this country has undergone,

On what the yellow fever zone depends, mainly.

during my long residence in it. It is as important as interesting to us, to know *why* the yellow fever should prevail in Brazil for the first time in 1849–'50. It has heretofore been the healthiest tropical city in the world, and now we hear of its first advent in Chili and Peru, (March, 1854,) and in Guayaquil in 1853; nor has cholera in all its destructive diffusiveness ever been known to have overstepped the equator.

The limits within which yellow fever may occur spontaneously, (the yellow fever zone proper) is a subject of deep interest to us, and the more so, if this can be influenced, and averted as I believe it can, by the power of man. In the latter period of the last century, and the earlier decades of this, it was common, almost annually, in some cities, as far North as latitude 40°. The ground is now assumed, and will be hereafter supported in this report, that the immunity now enjoyed by them, has resulted from no change of climate, or in the constitution of the inhabitants, (technically considered,) but has *arisen from the application and enforcement of sanitary laws and regulations.* My own opinion has been long since given,* that yellow fever is gradually blending itself here with the ordinary diseases of the climate and season. Even during last year, many cases (at least a dozen) in my own practice, during the raging of the epidemic, where the distinction and unequivocal symptoms of yellow fever could not be mistaken, and where this exact type occurred in the same individuals in a former year, during the prevalence of yellow fever. The bilious autumnal fevers of this country not unfrequently put on the yellow fever type (hæmorrhage, yellowness, black vomit) when the causes productive of these are much concentrated, that is, when the two conditions exist in a high degree; the same occurs in the *tierras calientes* (the low level region) of Mexico and some of the rural districts of South America—as near Guayaquil, and in the West Indias, as at Barbadoes, where they suffered nearly as much, as in the towns, and where the negroes suffered, for the first time from it; and epidemics of yellow fever, occasionally sweep through those countries, as it has

What has changed it.

Yellow fever blending with the ordinary fevers of the country.

Occurs in the marshy districts of Mexico, South America, and West Indies.

*Report to State Medical Society.

through this, last year, showing most conclusively, that when the causes which give rise to yellow fever, exist in an exaggerated degree, an epidemic is the result, whether in town or country, and that a sufficient amount can be accumulated to produce an *endemic* fever in a locality far removed from the ordinary yellow fever region, we well know, from what has occurred at Gallipolis, in Ohio, in 1796, and at Fort Smith, Arkansas, in 1823, if not in Louisville, in 1822.

Precursors of the yellow fever at Rio.

These changes of the types of disease, is no more remarkable than that different countries should be subject to different maladies. For three or four years preceding the first occurrence of an epidemic yellow fever in Rio, in the winter of 1849–'50, there had been a gradual change in the types of fever of that country, with an occasional case of unequivocal yellow fever (as recognized by those who had been familiar with it,) until its final development into a disastrous epidemic. Coincident and cotemporaneous with this great change in the diseases of the country, were proofs "that the broad features of the climate of Brazil had altered strangely, old residents declaring that the seasons were no longer such as they remember them to have been,"* all acknowledged an unusual state of the atmosphere existed, a remarkable absence of the usual thunder storms, which were daily, at a certain hour, during the summer season, a prevalence of winds from an unusual quarter, (the Northeast) besides other unknown but acknowledged changes. These less tangible variations have not been noted, or observed, nor do we yet know of the presence there of a faithful notary of science, to record those important conditions that instrumental observation can alone render valuable.

Simultaneous climatic changes.

Another impressive instance of the effects of climatic changes in the production of disease is furnished by Dr. Blair in his recent valuable work on the yellow fever of Demarara. Here, as in Brazil, it was noted that whenever the diseases varied or changed, they were usually preceded by some variation in the *climatic condition.* Thus in Demarara preceding the long

Diseases change with the climate.

*Dr. Pennell.

continued epidemic beginning in 1837, it was noted and even the "planters observed that the climate had changed. The date of the commencement and termination of the two rainy seasons cannot now be ascertained or prognosticated with the same precision as formerly. Land winds prevail in the rainy season, during night and morning only," &c.* Such, too, is the result of experience in all countries—such is reasonable where meteorology is well understood, and records are made; and every where, of the variations in the climatic condition; there the results arising from them (*disease*) can be anticipated and if we shall be unable to prevent, provision will be made for them, and their influence modified and curtailed.

Demarara.

Dr. Blair notices that "extreme seasons not only always modify the type of disease, but the effects of treatment; during the depths of the rainy season, adynamic and congestive types are prevalent and marked; purgatives now do harm; mercury too easily salivates; thirst is diminished. There is increased action of the kidneys, there are local congestions, headaches, drowsiness, sopor coma, watery stools." These effects I have constantly noticed in this climate for many years.

Do. modifies and influences treatment.

That the laws of vital action are influenced by meteorological conditions, surely we are not now to learn for the first time. Man learned it when he was first exposed to an inclement and variable sky, and has ever since used protectives against it. The foes of our race, it is very true, are not confined to these, but in the hasty generalizations of later periods these have been almost entirely overlooked, and the morbific materials have been almost solely attributed to agents that allow a more extensive speculation, and that furnish the data for a more prurient imagination. It is the duty of philosophy to curb this dangerous propensity, to confine ourselves, as much as possible, within strict limits, and allow due justice to all

Vital laws influenced by meteorological.

From *Guayaquil,* lat. 2° 15′ S., the Sanitary Commission has received the *first recorded evidence known*, of the yellow fever having appeared South of the Equator, (previous to 1849,

First yellow fever South of the equator.

*Dr. Blair.

–'50.) Dr. Wm. Jamison writes us, through the American Consul, of its having occurred there in 1740, and again in 1842. In the latter year it was fatal to twelve per cent. of the population. At Augas, 3,028 feet above the level of the sea, many died of the fever contracted on the banks of the river Guayaquil, but in no case was it communicated to the inhabitants.

And at unusual height of 3,018 feet, in rural districts.

Dr. Lacomb writes us from *Puerto Cabello*, through the United States Consul: "We have instances of black vomit occurring constantly in different parts of the interior of this country; lately, at Nutrias, nearly sixty per cent. of the population died of it. Also, at the Aragua Valley, in Valencia, the capital of the province, situated nine leagues from this place, many cases occurred among the creole population; especially young people. In Caraccas, five leagues from Laguayra, many cases were fatal among the creole population."

Do. in rural districts and with natives.

In *Barbadoes*, although clearly and palpably originating there from local causes, it soon spread over the entire Island, and was just as bad in the rural districts as in the town.*

Do. in Barbadoes.

Many instances were mentioned and will be found in our record, of *repetition of attack*, and the liability of those born here, (and not of creole parents, and some that were, and grown,) were very numerous, more so than has ever been noticed before, even reaching the limits of adult life, and the dread of yellow fever began to be brought home, and even experienced, by the fully developed natives. This has been attributed, during the fever, to the uncommon malignity of the disease. May be the opinion I have heretofore advanced is the true one, and I repeat, although in vivid recollection of the scenes of last year, that the clear and unequivocal type is not so distinctly manifested in the *mass of cases*, as it was twenty or thirty years ago. A hope is entertained in Charleston, that from the liability to attack of the more advanced adults, and in proportion to this retardation of age, there "exists the strongest possible proof that our circumstances are undergoing a change of a nature calculated to sustain the opinion, that yellow fever is gradually ceasing to be an en-

Deductions from its blending with the ordinary fevers, not only here, but in Charleston.

* From Dr. Sinclair, through the U. S. Consul, to the Sanitary Commission.

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demic or climatic disease among us." If this is true, I know no reason why it may not apply, also, here. The hypothesis is an interesting and important one. It is very certain, that the liability to attack a second or third time, or even oftener, occurred in Philadelphia and other Northern cities frequently, and was the forerunner of its entire departure from among them; whether as the consequence of this change, we shall not undertake to determine. I am of opinion, that in former years, *this was not the case with us;* that in latter years it has become more common, and that the fever is becoming *more and more indistinguishable from the ordinary fevers of the season and country.* If with this we can lodge the hope of its departing from among us, or that the yellow fever zone is being removed further South, then, I am very willing to entertain it; but, I wish it distinctly understood as my conviction, that this change of zone, when once established, (and man must have created it by making the localising conditions,) is determined from the exercise of man's intelligence *in controlling the specific conditions upon which yellow fever depends,* (upon which we shall dwell hereafter,) and not upon any spontaneous climatic change, or evidence of cycles occurring, without some efficient cause.— These views are not at all incompatible with preceding observations, in which climatic changes in Brazil and Demarara preceded the outbreak of yellow fever there. Climatic conditions are the predisponent, but without the localising circumstances, (the second blade or "terrene,") as we shall see when we come to state them, yellow fever can no more occur than it can in a country without subjects.

This occurs thro' man's agency.

Without some considerable elevation of atmospheric temperature, periodical or autumnal fever does not occur at all. When it occurs in cold and even in temperate climates, it is only during the hot weather, or towards the middle of summer; that a summer temperature of 60° is necessary for the production of the disease, and that it will not prevail as an *epidemic,* where the temperature of the season falls below sixty-five degrees, and disappears on the

Occurrence of fever dependent on temperature.

succession of frost.* Dr. Drake, in his great work upon the Diseases of the Mississippi Valley, remarks that the geographical limits of fever in this country, are East the Apalacian Mountains, below the 33d° of North latitude, beyond which these mountains do not extend. Below that parallel it has no Eastern limit but the Atlantic Ocean. Southwest of the Cordilleras of Mexico, and the Southern Rocky Mountains, constitute its boundaries. I have found in the City of Mexico, (situated near eight thousand feet above the level of the sea,) continued and intermittent fevers to constitute more than a sixth part of the annual mortality. In higher latitudes, it ceases in the great plains of our Western desert, long before we reach the mountains. It is almost unknown, says he, at the distance of three hundred miles from the Western boundary of the States of Missouri and Iowa, above the latitude of 37° North. In the South it does not prevail as an *epidemic* beyond the parallel of 44°, and ceases to occur periodically about 47°. The actual temperature here, last year, is shown with great particularity in tables B, C, D, T, and K. I trust there is no room for skepticism, then, to doubt the power of temperature in the production of fever, and there is as little doubt it is as much influenced by the hygrometer as the thermometer.

Its geographical limits.

Humidity is certainly the greatest when connected with a high temperature, and is most influential in the production of fever. This is exhibited in table H—showing the different mortalities of the same people, in the healthy country of Holland and Belgium, where the average annual temperature is less than 50°, and here, where it is upwards of 67°, with an average dew point of less than 43°, and here where it is near 62°, and with an average "temperature of evaporation" of less than 47°, and here where it is 64°.

Humidity affects health differently in different temperatures.

The mode of determining the amount of humidity is the most important, as it is the most recent point gained in the cultivation of meteorology, and the study of climate influ-

Its amount in the atmosphere recently understood.

* La Roche.

ences on our race. One most interesting fact has been developed, which may be considered the key-stone of the great value of this mode of investigation, viz: Under the same temperature two sections of country will enjoy a different climate and salubrity, from different *hygrometric conditions.* One will exhibit a high saturation, producing a relaxed vital system, with energies more or less crippled, and extremely destructive to health and life. The other, where the hygrometer is lower, presenting a drier atmosphere, producing a greater elasticity of body and mind, with a power of endurance to which the other is a stranger, and with a continued enjoyment of health. In corroboration of this, the testimony is very ample. Humboldt mentions that "Cumana is the hottest, driest, and healthiest among the equinoctial towns of South America." In various parts of our own country, and even in this city, the fact of the coincidence of a great degree of dryness and health is abundantly shown, and so it is in various parts of Africa and the West Indies, and it is not *until the rains occur that fevers break out.*

Fevers not in proportion to amount of moisture, but a large proportion always required

Let it be distinctly understood, also, that fevers do not prevail *in proportion* to the height of the dew point, or amount of moisture *alone*, but that they *do not prevail without a high dew point*—that is, that a large amount of moisture with a high degree of heat, is essential to the evolution or development of the high grades of fever. Our second condition to constitute "the shears" complete, is equally required for destructive effect. Moisture, no doubt, is the controlling sanitary condition *at all high temperatures.* The distinction is very important. In a preceding section, on the "cost of acclimation for different nativities," the different effects are beautifully and satisfactorily shown on the same people emigrating from a country of great humidity and low temperature (Holland and Belgium) to one of high saturation and elevated temperature. These important facts were eminently illustrated last year. With an extreme of temperature in parts of the Southwest, there continued general health, *un-*

Different effects of humidity at high and low temperatures.

til humidity was added to it. Thus the devastation was extreme. The invaluable testimony upon this subject given by Professor Blodget, through the vast means, the net work of scientific climatology which the Smithsonian Institute is spreading over our own county, is incalculable. The excessive heats of Lower Texas, the Rio Grande valley, and other districts where the thermometer rises to 112°, 115°, have a *temperature of evaporation* not above that of New Orleans, with the air at 87°. At Austin, Texas, with the air at 98°, several times in June the temperature of evaporation never rose above 78°, and at the highest air temperature was at 74°, 76°, or nearly ten degrees below the temperature of evaporation at New York, where the air thermometer did not exceed 95°. The heats of these districts are therefore endurable, and even pleasant, at a degree which would seem fatal to life, from the great evaporating power and elasticity of the atmosphere, which uniformly prevails.*

Proofs.

Nor is the quantity of rain that falls in a country the best evidence of this condition. A retentive soil, flat country, extensive marshes, and large bodies of water will furnish the facilities, with a high temperature, for a great and dangerous humidity; while a rocky, clayey, sandy or absorbent soil, and considerable declivity, will rapidly accelerate with winds from drying quarters, the removal of the rain that falls. Hence, the annual precipitation is not the best test of the humidity of a country.

Quantity of rain not exactly a proof of amount of moisture.

The sickly season of nearly all countries, is the rainy season, and where there is an exception to it, it almost surely exhibits a marshy, that is, a partially dried swamp, which is more favorable to the accumulation of moisture in the atmosphere than when entirely inundated. This is very clearly exemplified by the occurrences at Tampico, in 1836. The rains usually commence there in July, and are followed by intense heat. This is the period of the yellow fever.

Rainy season the sickly season.

* Letter from Prof. Blodget to me.

In the above-mentioned year the rainy season commenced two months later than usual, and there was a corresponding delay in the appearance of the disease.*

Proof at Puerto Cabello.

At *Puerto Cabello,* Dr. Lacomb states that "it is a constant and general rule that the place becomes entirely free from disease, and the healthiest in the world when *strong heat, combined with total absence of rain and dampness* prevails, the atmosphere then being entirely dry." On the contrary, "during the two last years, 1852–'53, the weather was very hot, and *very damp*, with frequent small rains; during all this period yellow fever prevailed."

Do. at Bermuda.

In the Island of *Bermuda*, a proverbially healthy place, there has occurred during the last summer, that precise combination of "unusually heavy rains, and scorching hot weather, without anything like a breeze for days, and filth from an old stranded vessel now exposed," followed by a mortality of one in every seven.†

At New Orleans.

Probably no condition is so eminently injurious to the salubrity of New Orleans, as this great humidity, not merely of itself, but it furnishes the agency, either by solvency, combination, or otherwise, with temperature, for those influences that are so destructive to health and life here. The actual amount is shown in the tables, (and I wish I had room to show the comparison with other countries.) A very partial examination of these tables will clearly demonstrate, when contrasted with the monthly mortality, how destructive to health is a nearly (and indeed often) saturated atmosphere, accompanied with high temperature. *We have never had an epidemic yellow fever in this country, without this combination!* most of these records are before me, besides a personal recollection which extends back upwards of thirty years. I am aware that there have been counter statements, but they are entirely unsustained by records or experiments. The temerity has even gone so far as to refer to years, to corroborate it. My meteorological journal for those years show them to be void of accurate data.

Denied.

Goupillian, from La Roche. † Communication through Prof. Blodget.

Two years have been specified, viz: 1837 and 1841, as being *very dry*, and at the same time *epidemic years*. My Meteorological Journal states for the first, that although for the whole year, the total amount of rain is small, yet there fell during the month of September, (the very month in which the mortality was more *than double that of any* other month,) *more rain fell than the average of the ten preceding Septembers!* That there fell during the preceding three months more than ten inches of rain, and that in October, which was the next most fatal month, there fell more *than double the average* of five preceding Octobers! and that of the latter, (or 1841,) *more than 50 per cent.* of rain fell that year, than the average of the preceding ten! So much then for facts and records, *vs.* memory and speculation!

But recorded proof of its correctness.

Mr. Darby, who has written a work on this country, of quite considerable authority, about half a century ago, is represented to say in it that "for eight months in the year, *after* the season of inundation, *lower* Louisiana is drier than any woodland in America." He does not pretend to sustain this hazardous assertion by any records of precipitation, or other evidences. It is not probable, with the great removal of forest growth, which tends to dry a country more than anything else, which has taken place since this was written, that it has tended to make it *more humid!* From a hydrographic survey, *one-eighth of the State is constantly under water; two-fifths of it subject to inundation!* In Louisiana, we have two rainy seasons; that for New Orleans culminates in February and July, which differs but little from that of other parts of the State, excepting, probably, West Feliciana, which in a period of thirteen years, terminating in 1833, had then *three* rainy seasons, (April, July and December,) with an annual average of 61.344 inches! The annual precipitation on Red river, near Alexandria, was 67.400 inches; of Plaquemine parish, below New Orleans, 67.080 inches, and in this city a fraction over 52 inches. From these causes, her extensive morasses, impermeable soil and flat country, Louisiana is unquestionably *now*, and no doubt, has *ever been* the most humid State

Unfounded statement of Darby.

Positive proof of its erroneousness.

in North America. These circumstances give rise to our constant fogs that are so injurious to health. Were the swamps in our neighborhood drained, and forest growth removed, these would in a great measure subside, and their morbific influences abate.

We do not pretend to say that the yellow fever is rife in proportion to the amount of moisture existing in the air; but we do not doubt that a large amount of it is *indispensable* for it.

Moisture indispensable.

When satisfactory scientific investigations on this subject shall be extended to all the places of its occurrence, even that amount may be determined. Whether it is a mere vehicle for the poison, or prepares the system for its influence, or it is the combination, a large amount is certainly required for the existence of the disease. Hence then, the discrepancies upon the subject, neither alone being sufficient, but with both and a high temperature the disease is not often absent.

Proof in Flanders.

Dr. Home made some experiments to show the connection of humidity and disease in a campaign in Flanders. He carefully measured daily with the hygrometer the degree of moisture and dryness of the air, and upon comparing his tables with the register kept of the sick, he found that the progress of the disease kept pace, as far, he says, as anything of the kind can do with the humidity* of the air. The whole meteorological condition has been kept by me here for many years, including the hygrometry, and it has always appeared to me that the *direct* influence on the health of individuals, with its varying conditions, not only in yellow fever, but with large classes of disease, has always been clear and unequivocal. Its influence last year I have shown to have been very conspicuous. The special details for the epidemic months are given in the tables, as taken five times daily, with the cotemporaneous mortality; the *dates* of the occurrence of the disease would have been more exact, but could not be procured.

It is supposed there is necessarily great moisture at sea, and that where there is a foul vessel much disease should exist in

* La Roche.

warm weather. There is a great mistake upon this subject; it is now well known that the main means to keep a vessel healthy at sea, is not merely to keep her clean but *dry*—by stoves, dry rubbing and other meaus. The evaporation from the sea has been greatly overrated. The calorific rays mostly pass beyoud the transparent surface and are lost below; in proof that the temperature of the sea, when deep, is not influenced by the suu; but wheu we arrive "off soundings" the thermometer gives us the earliest warnings of it by its depression, the dew point is not as high far out at sea as uear the shore, and but little dew falls; hence the little injury sustained from sleeping exposed to the air at sea. But wheu we approach a coast it is very different, and especially the estuaries and mouths of rivers, as I have ascertained by actual experiment. On the deadly coast of Africa, a few miles from land there is entire protection from the maladies of that sickly region, but near shore, and particularly uear the mouths of the rivers, it is very moist and very sickly. That keen observer, Dr. Rush, attributed the differeuce in salubrity of the two, to "a mixture of land and sea air." Our more accurate means of research, that scieuce now furnishes in the hygrometer, enables us to explain it with more precision.

Error in supposing great moisture at sea.

It is only so near shore.

Of the direct effect of swampy districts upon the health, even of those accustomed to them, reference is most confidently made to the sanitary condition of the four Southwestern States as exhibited in sauitary maps prepared expressly to exhibit it, made from the returns to the census bureau for 1850, showing the condition of each one of the counties of those States by the author, and published in the 5th volume of the Transactions of the American Medical Association.

Effect of swampy districts on health.

The examination into the effect of the imperfect drainage of towus under the authority of the English Goverument, is still more direct and applicable to the subject under consideration. I quote briefly from various parts of these valuable reports, to show the influence of it in the high latitude of 53 deg. How much more injurious must it be here. "When a street is wholly without

Effect of drainage of towns on moisture and on health.

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drainage fever instantly breaks out in it." "Particular houses were pointed out, from which entire families were swept away, and from several of the streets fever is never absent." We find a very striking account of a "fever constantly breaking out in a General Lying-in Hospital, clearly traced to the influence of above fifteen hundred yards of open ditches, full of the stagnant filth of the neighborhood, (like Gormley's and others,) and to the backing up of the main drain of the premises, whereby the whole basement was flooded with every description of decomposing impurities. On the removal of these nuisances, together with a new method of ventilation, the fever disappeared. Another instance is given of a "village in a slight hollow, and badly drained, with a wide, stagnant ditch passing through it." "Here the deaths by epidemic disease were thrice as many as in a village in the neighborhood, and the scarlet fever was so malignant as to be fatal in a few hours." Sometimes, in the best ventilated squares, "the neighborhood of the cess pools, and a number of untrapped openings produce the most malignant fevers." Liverpool, which is situated in one of the best natural sites, is the most unhealthy city in England, because a large number of her population live and sleep under ground, and she has thousands of houses and hundreds of courts without a single drain of any description. "A table is given of districts in Leicester, being divided into three classes; first, culverted; second, partly culverted; third, not culverted. The proportion of persons dying of epidemic diseases are, in the first one-twelfth, and in the second only one-eighth of those who died in the third!" In some of the towns the description would fail to convey any conception, says a talented physician, of the disgusting and poisonous condition, and he exclaims "can such a state of things exist in a country which has made any progress in civilization?" Yet, such a description would well apply to many parts of this city during the last summer!

It is a matter of record that the intermittent fever in the rear of this city has greatly increased since the exposure of the swamp in that neighborhood, probably twenty to one of what it was before.

The amount of moisture depends upon the dissolving power of temperature; the question is then, not exactly what that amount is, so far as mere saturation is concerned, for the effect of saturation at different temperatures is very different, (as shown how comparatively innocent it is in the cool, moist climates of London and Holland, compared with intertropical regions, with their elevated temperature,) but it is the influence of the *combination* at this *high temperature*, and to such an extent as to co-operate with all the powers co-existing, that are more or less incompatible with health, and especially, with those unaccustomed to or unacclimated to them.

Amount of moisture dependent on temperature.

Of the fact of a high degree of moisture in an elevated temperature, being injurious to health, we trust the above evidences are sufficiently satisfactory. The explanation, or *modus operandi* may be more difficult. That it relaxes and prostrates the system is a matter of common experience; that it prevents the elimination of effete and worn out excretions, that it debilitates, by excess of action, the healthy functions of the skin and lungs, every one will acknowledge who has experienced it—diminishing the decarbonizing power of the atmosphere which is always lessened as the temperature is high, air expanded and saturated with humidity. When the hygrometry changes to a dry air a sensation of elasticity is at once experienced; when it becomes high, languor and prostration has to be endured; that our health is influenced in a corresponding degree, is fortunately, now fully established. *High temperature* may produce the physical susceptibility—*moisture* may be the medium of agents from our second condition, and when they are all in excess, the malignancy of the disease, will be proportionate. Such has been the precise condition of things here last summer.

How great humidity acts.

That there is dew point peculiar to each of the higher classes of fever (in their aggravated or epidemic grade,) is doubtless true from what we know of the temperatures essential to their existence, and how greatly they are all injured by humidity. The dew point of yellow fever is from 70 to 80, it rarely exists long, when it is under 60°. The plague has probably a dew

The dew point limits of yellow fever.

Plague.

Typhus gravior, and cholera.

point of 10° less. The typhus gravior at from 35° to 45°; and the cholera in this climate, varies from 48 and sometimes much less to 74, and is probably less controled by its fall than yellow fever.

Sources of it here.

The *sources* of this great excess of humidity are mainly the swamps, lagoons, lakes around us and which are also the principle causes of our fogs, imperfect drainage and want of pavements.

Radiation as a cause of disease now first noticed.

RADIATION, * as a source of disease, has not heretofore, as I am aware, attracted the attention of professional men; yet, no observant practical man who has passed through many epidemic yellow fever seasons, could have failed to notice, the peculiar weather that usually exists during the *clear* days of those seasons. In fact, old experienced men out of the profession have been in the habit of denominating it "*yellow fever weather*," without analysing the conditions which constituted it. It is characterized by being *very hot in the sun and cool in the shade at the same time*—on one side of the street a broiling temperature, and on the other so cool as to urge to buttoning up the coat. This uncomfortable alternation of chilliness and heat, is productive not only of uncomfortable feelings, but when exaggerated, passes into disease—constitutes the first stage of yellow fever. It may be here only the exciting cause, developing dormant disease, from the predisposition being already present. The difference of the temperatures between sun and shade, is at these times, very great, and essentially constitutes, *with other circumstances*, a sickly season. My attention has been called to it for many years, and it has been carefully noted by me not only here, but in other countries. I have not remarked it to influence materially other diseases, beyond the class of *fevers*, except *coup de soliel*, of which doubtless it is the principal cause. During last year it occurred unusually early, in January, and furnished one of the grounds of the prediction of the great epidemic. This principle is illustrated in the accompanying Chart No. 2, and Tables D, E, N, O, to which reference is invited. A more thorough proof could be made

'Yellow fever weather' described.

* Solar radiation, derived from the difference between the temperatures of the sun and shade.

by a comparative exhibit of other years. It is too minute for this paper, but the opinion expressed is fully borne out. The unusual amount of solar radiation last summer, has been fully proved in several parts of the yellow fever region. It has been particularly noticed at *St. John Baptist*, by Dr. Delery of this city, where he remarked that "the planters found the sun's rays so intense, that they were compelled to use umbrellas *for the first time* as a protection against it," the yellow fever prevailed here very extensively. It was also noticed at *Hollywood* and at *Gainesville.** Shown elsewhere, at St. John Baptist.

At *Gainesville*, Mr. Fulsom had found the heat in the sun so great that he frequently rode under a tree, to avoid its intolerable influence, and for fear of taking *a chill*, he was presently *compelled* to *quit* the *shade!* The same facts were observable at Hollywood, and in Wilkinson county, in the unusual and uncomfortable difference between the temperatures of sun and shade. Dr. Benedict observed the same thing in New Orleans, as early as July, when "in riding in a gig in the streets, with the top up, it was found so cold as to compel him to lower it, to procure the warming influence of the suns rays. This was soon found so scorching as to induce him again to put the top up! and this *was several times alternated* from the great difference in the extremes of each.† At Gainesville At Hollywood. In New Orleans.

These remarkable conditions would doubtless have been recorded at other places, had the attention of observers been called to them. It is probably the "fiery something," to which yellow fever has been formerly attributed by those distinguished and experienced observers, Drs. Chalmers and Lining, of Charleston. The profession may be assured that it plays a much more important part in influencing the production of morbid action, than is yet known. Its precise modus operandi I forbear to speculate on. Is it by decomposing ozone, the great purifying principle? The direct causes of the varying radiations of different climates, Probably the "fiery something" of Chalmers and Lining.

* See testimony. † Refer to Dr. Benedict's interesting paper.

elevations and periods of the day, are quite obscure. In experimenting on this subject, I have often noticed a variation of from 5 to 10° occur in a few minutes, (from 5 to 20,) without any apparent difference in the clearness or transparency of the atmosphere or change, of the winds.*

Terrestrial radiation.

Terrestrial radiation (or that proceeding from bodies on the earth,) is the true interpretation of the danger of exposure to the night air. This exists in excess in sickly climates and seasons. It constitutes what is so much admired in the dangerous, but "beautiful blue sky of Italy," the air so clear and transparent, (upward radiation,) rapidly cools the body, chills it, and often preludes the first stage of fever. It is as tempting as hazardous in hot weather. An umbrella, portico, tree, musqueto net, *any object* intervening between the body and clear sky, protects one from it. In the thickly built parts of cities, this radiation is very small. The best radiators are cotton, silk, wool, (rotatively,) and consequently we are least protected by clothing made of those materials, in the order mentioned. We thus interpret the alledged injurious effects of sleeping exposed to the direct influence of the moon. It is always greatest on bright and brilliant nights.

Where the principal danger of night air.

Increase of radiation in proportion to increase of latitude.

For the proper appreciation of the chart and tables, it may not be out of place to state, not only that this is not merely a most unusual amount of radiation for this climate, but that the popular estimate upon the subject is a gross error, so far as it supposes that the intensity of *direct solar heat* increases as we approach the equator; *in fact. it is just the reverse!* Baron Humboldt found "the difference between the temperature in the sun and shade at Cumana, one of the *hottest, driest, and healthiest* in the lower regions of equinoctial America, never exceeded 6° 6', sometimes not more than 1° or 2°. Captain Sabine found the maximum at Sierra Leone 18°; at Bahia, on the coast of Brazil, 9°. I have rarely seen it exceed 20° in Cuba or Vera Cruz, and have often remarked how sel-

Proofs.

* The reason why persons insulated, or confined to the house, are rarely subject to yellow fever, may be that they are not exposed to solar radiation.

dom umbrellas are used in tropical countries, and how rare it is to have many trees *immediately* around their houses to protect them from "the *ardors of a tropical sun!*" There are some grounds for the belief that it either increases with elevation, or we become more sensible of it, from diminished pressure of the atmosphere, for such seems to be the case on ascending mountains. De Saussure states it as the result of his experience on his ascent of the Alps, and it was of mine in Mexico; so dangerous is it esteemed in the elevated regions of Mexico that the natives always carefully protect the loins of their horses (their weakest part) with an extra covering of skin, when in use, and often their heads. In Jamaica, while on a level with the sea, the difference between two thermometers, (or radiation, the one in the sun and the other in the shade) was at the maximum 12°; on the mountains it was nearly double. In England, it is usually found about 50°, and sometimes as high as 69°; while it has been found at Mellville Island, latitude 65° North, 55° in March, and *sometimes as high as* 90°! Captain Scoresby, in latitude 80° 19, found it *as high as* 80°. Sir John Richardson, in his late expedition to the Arctic climate, found the power of the *direct rays* of the sun so great, in a cloudless sky, that he had to "take shelter in the water while the crews were engaged on the portages!" and Captain Scoresby found that the pitch in the seams on the side of his vessel, *occasionally becomes fluid*, (which it *never did on the coast of Africa*), a temperature of almost 130°, while ice *was rapidly generated on the other*, *in the shade!*

Influence of elevation upon it.

Illustrations.

Let us apply these remarks, for a moment, to the economy of nature, and see if we cannot draw some illustrations in proof of the correctness of the statement. It is thus that we can account for the productions of the rapid Springs in the Northern climates, where vegetation leaps, as it were, at once into being, while, if otherwise, its productions would not have time to mature and ripen for the sustenance of man. The cereal crops are known to be so much dependant

Proofs, in its influence on the vegetable kingdom.

upon its amount, that it has become a matter even of *calculation* in England, and it is so well known that without the *direct rays* of the sun (whatever may be the temperature of the air) that fruits seldom come to perfection. So great is this radiation in England, that many *tropical plants* cannot bear the *direct rays of the sun there*, and require protection in order to reach maturity! That the indirect (or shade) temperature is not solely dependant upon the *direct*, is proved from the fact that they reach their culminating point almost always at different periods, and the exceptions here *are during the occurrence of epidemics!* In non-epidemic years the highest point is probably in May. So, in England, it occurs about *two months in advance* of their *highest temperature.*

These views, now so well established among scientific men, in their influence on the vegetable, and even the animal kingdom, extends beyond their bearing, on our profession, but I forbear its introduction, tempting as it is.

Radiation worthy of farther investigation.

Should I not have been entirely successful in establishing the connection of radiation as one of the efficient agents in the production of yellow fever, I have, at least, pointed out a new field for philosophical investigation, that has hitherto escaped the scrutiny of pathological induction. It is certainly shown to be within the laws of the dynamic forces, and highly worthy the notice of the etiological inquirer.

Pardon is asked for this digression from a subject as novel as it is interesting and important. It is clearly apparent that it is entitled to more thorough investigation than it has yet received. What is due to each climate is not known. I have long since requested the Smithsonian Institution to add it to the requirements from its meteorological correspondents, throughout the country. It would not depart far from the rules of probability to say that whatever influences the physiology of the vegetable and animal creation must also influence their diseases. In this climate, I do not consider ten years of observation sufficient to determine what is the normal amount, but believe that beyond 30° or 40° maxima, is productive of injurious influences.

Influence of winds.

WINDS.—All experience has shown that free ventilation and strong, unimpeded currents of wind are inimical to the elimination and concentration of malarial exhalations, consequently, to the production of fever; that where the winds blow strongly and freely, and find no obstacle from surrounding objects, or intervening forests, localities which otherwise, might be expected to be fruitful sources of fever, may be visited or inhabited with impunity, while similar places become insalubrious, if the air is stagnant.* Calms, says Dr. Drake, permit the exhalations from foul localities to accumulate in the atmosphere, which rests over them, but all winds operate to disperse and dilute them with purer air.

Amount of moisture in each.

By reference to the table P and Q, it will be seen that on an average of years our most prevalent winds during the summer are the East, South, SW. and SE., and by referring to the table of the hygrometry of the winds here, (or the amount of moisture each of these conveys with them, table P,) it will be found that these are the very winds which are usually loaded with the largest quantity. That table also shows that when the air becomes calm (or stagnant) it becomes still nearer the point of saturation. During the worst period of our epidemic the most frequent wind was from the East. That is a pretty constant feature, not only in our epidemics, but most others. Still more remarkable was the frequency and long duration of onr calms, with all their injurious saturations and depression of the vital principle.

Direction.

Unwholesome nature of land winds in summer.

Nearly all land winds are unpleasant, if not deleterious to health, in most climates, producing a sensation of chilliness and discomfort far beyond their mere thermal influence. It is the "simoon," of most countries; in Havana and Georgetown, Demarara, it is a South wind; here, and in Texas, where it is felt so severely, it is a North wind. These winds produce a rapid evaporation from the surface of the body, causing extreme dryness, while the sun is unclouded and hot, (during the warm months,) and is excedingly uncomfortable. Fevers of a bad

* La Roche.

character are then known to prevail. It was upon this ground, mainly, that I have advanced the opinion of the protective influence of Lake Pontchartrain.

System of balances.

No one can doubt that there is a great system of balances in the natural, as in the moral world. In the animal and vegetable kingdoms a great predominance of either, is unfavorable to the other; where they are equalised, health results. Great heat and moisture promotes an excess in vegetable life. It is injurious to man. All excess tends to disease, while moderate changes are conducive to health, "all natures' difference, is all natures' peace." This has been often remarked in hot and other climates. During the late epidemic yellow fever, at Bermuda, it was remarked that "an extraordinary state of atmosphere prevails here now, very favorable to vegetable life, but dangerous to animal life and health."

Apology of records imperfect.

We think sufficient has been said to show in what this epidemic consisted. We would not be understood to mean, that the exact amount of heat, moisture and decomposed materials, were ascertained to have produced it, and that there were no other materials than those we have enumerated. For the more exact application and showing of these influences, the meteorological journal of the three epidemic months is annexed, in detail, as noted four or five times daily, made up during the intervals of the exacting demand for our time during that laborious period, (the month of July was kindly kept for me by my friend, Dr. Benedict, and the balance by myself.) Every record was made that was in our power, conscious as we felt, that we were in the midst of the most important, and therefore, the most interesting, pathological year, that ever occurred in America, and that we should be held responsible, by the scientific part of the profession, and the public, to make every observation that could have any bearing or influence upon *it*, and therefore *our*, future; and have essayed to make a faithful statement of that gloomy period. How it will apply or aid us in influencing that future, time alone can tell. No such exact or extensive record is known to us as having been made before with which to compare it. But we trust many such, and better, will be made hereafter, should it be the misfortune of this, or any part of our country, to be afflicted with a similar calamity.

Exact amount of the materials for an epidemic not known.

The exact amount of the *meteorological and terrene causes* to produce fever, and especially, a malignant epidemic yellow fever, is not known; it may be hereafter. A distinguished authority informs us that "since the beginning of the world, the temperature and humidity of the atmosphere have, perhaps, not been twice in identically the same circumstances for eight consecutive days."*

Duration required for disease to be developed.

However this may be, and as duration is an important element in everything relating to health, there is no doubt of the fact that all the agents productive of yellow fever, whether climatural or terrene, are in the nature of things more or less fluctuating. So is the physiological condition of the individual; but I have as little doubt that it is an approximative duration around a very narrow circle that is required to produce the impression resulting in a yellow fever season; that is, that an elevated temperature, high saturation, excessive radiation, with terrene causes in large amount, shall *coincidently exist*, although they may slightly fluctuate, for a period, which, according to my observation, to overcome the physiological or vital resistance, shall be rarely less than about two or three weeks, dependent upon the susceptibility of the individuals exposed. It is under such circumstances that yellow fever rarely fails to follow. During my long residence in this climate I have rarely seen such a prolonged continuance (the above duration) of identical weather, if in excess, whether of heat or cold, dryness or moisture, but was productive of disease of some kind. Variable weather and seasons are usually healthy, though this is opposed to popular belief. Such is the play of the organism, and such are the variations required to give it tone and impart to it vigor. Professor Schönbein has given many reasons for the belief that fever arises from a deficiency of

*Arago and Schubler.

ozone. No experiments were made to test it here. If ozone is developed, as is alleged, by the approach of two clouds of different electricities, that often takes place during the existence of our yellow fever epidemics, with, as before remarked, *injurious effects*, its evolvement may be at too great an elevation above our immediate atmosphere to benefit us. If we possessed the certain power of foretelling, long beforehand, and *always*, the advent of a great epidemic, thousands of lives would be saved. I do not know that we could do as much by filling the atmosphere with ozone, which would be very costly. A writer in one of the prints during the summer advises its being "drowned out," which I thought highly plausible, if possible, the Mississippi river at such periods having usually descended so low as, if introduced, could only influence the low back streets. But the *cheapest, best and most rational mode*, after all, will be found in the practical application of the *means of prevention*, by the introduction of those sanitary measures that experience, fully tested, has shown to have saved other communities from pestilence, and restored them to salubrity. They will be fully detailed hereafter.*

Advantage of foresight and remedies.

In this early application of meteorology to disease, I ask the indulgence of the profession for the paucity of my records. Enough has been given to show that the connection is most intimate between them, sufficient to assure us of vast hidden truths, far beyond our present means of investigation; these truths are of value to science and humanity; indeed, there are no useless or disconnected truths in the great labo-

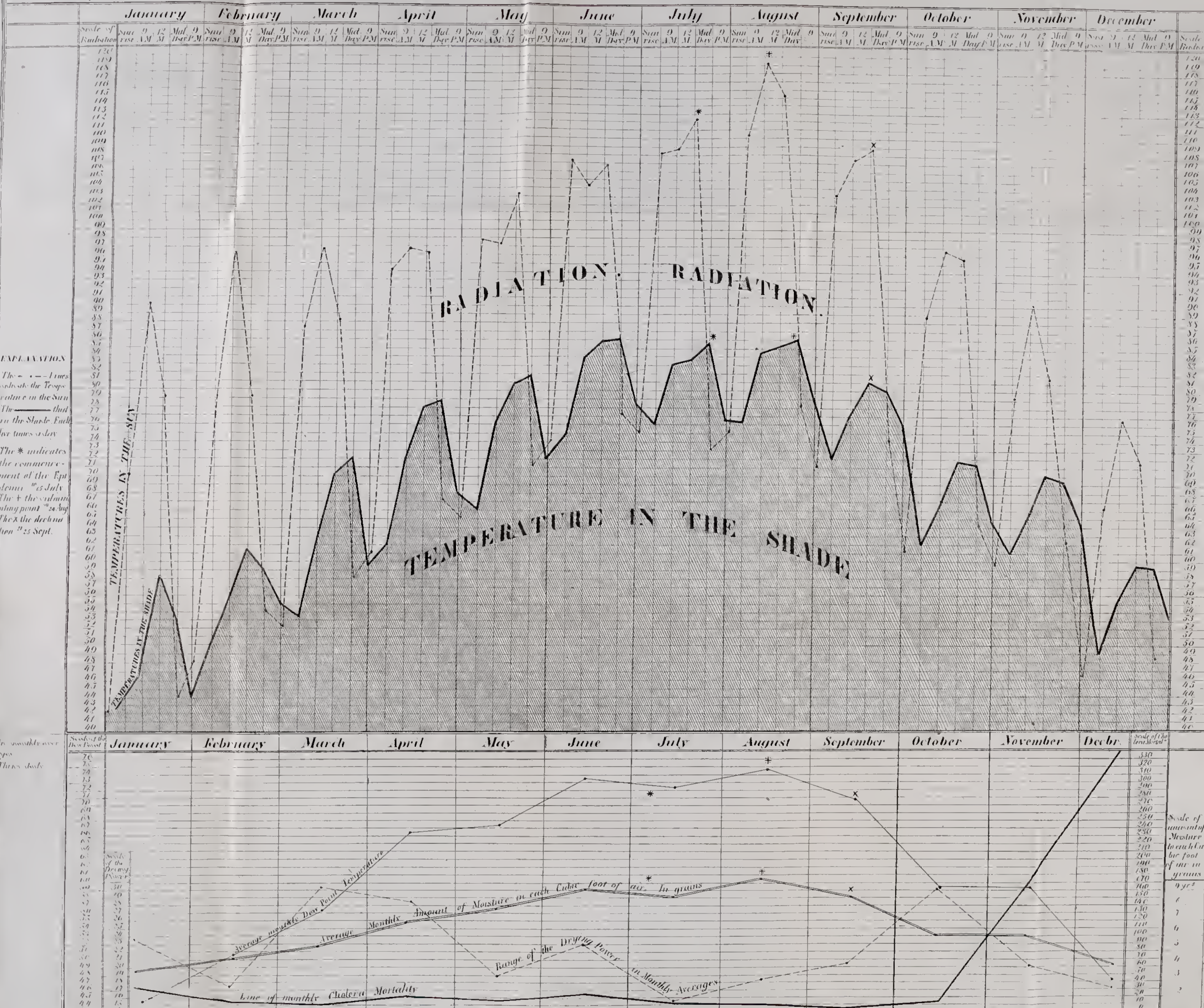
No truths valueless.

* Tables C, D, E contain the daily meteorological and mortuary condition during the three epidemic months. I would gladly add the whole year of both were the latter practicable, for the gratification of scientific men, to show how much climatic conditions influence our weather, and especially, during this remarkable year.

In interpreting the connection of meteorology with *mortality*, two circumstances are to be taken into consideration: first, the amount of vital resistance to be over come previous to the attack, (for it cannot be at once,) and second, the period to elapse before resulting in death. These, as yet, are indeterminate and irregular periods, dependent upon individual susceptibility and constitutional power. The second is easier estimated than the first, for the *average* duration of the *disease* is from three to five days. We sometimes find in the advanced period of the season that a sudden great fall in temperature produces a frightful mortality, cutting off all who are very sick, unless carefully protected; and here a little foresight of a coming change can often be put to most valuable use. In this case it is almost equally apt to prevent the further continuance of the disease, *provided the change is a permanent one.*

CHART B *illustrating the Influence of* SOLAR *and* TERRESTIAL RADIATION *and* MOISTURE *in the production of* YELLOW FEVER *in* NEW ORLEANS *DURING 1853*

Prepared for the Report of the Sanitary Commission BY E.H. BARTON A.M.M.D.



	January	February	March	April	May	June	July	August	September	October	November	December	
Yellow Fever mortality for each month	2	1			1	21	1409	5362	1132	205	25	11	8 093
Total mortality	679	444	463	532	671	656	2216	6201	1627	674	112	844	15.116

January	February	March	April	May	June	July	August	September	October	November	December

"C." Meteorological Register, for New Orleans, kept by E. H. Barton.

JULY, 1853. LATITUDE, 30°. LONGITUDE, 90°.

Altitude of Thermometer above the Earth ... 5 feet.
do of Rain Gauge,................ 15 feet
do of Barometer above the sea,...... (1 0 14)

Explanation.

ASPECT OF SKY.—0 Represents entire cloudiness,
1 " a slight degree of clearness, and so on, until
10, " which represents entire clearness.

WINDS.—0 signifying calm, 1 a very gentle breeze, 2 a gentle breeze, 3 a fresh breeze, 4 a strong wind, 5 a very do. do., 6 a storm or storm.

Day of Month.	Barometer at Sun Rise.	9 A. M.	3 P. M.	9 P. M.	Range.	Thermometer outside, in open air, in shade, at Sun Rise	9 A. M.	3 P. M.	9 P. M.	Average.	Range.	Aspect of Sky at Sun Rise.	9 A. M.	3 P. M.	9 P. M.	Anemometer, Course and Force of Wind at Sun Rise.	9 A. M.	3 P. M.	9 P. M.
1	30.13	30.13	30.11	30.14	.03	77°	84°	86½°	80°	81	9	5	6	4	10	N. E. 1	N. E. 1	S. 2	S. 1
2	12	.17	.17	16	.05	79	87	80½	78	81	8	9	5	0	8	S. E. 1	S. 3	S. 2	E. 1
3	......	.13	8	.23	.10	....	84½	82	81	..	3	..	6	6	10	......	S. 2	S. W. 1	0
4	.14	.29	.23	.25	.11	78	80	83½	79½	80	5	8	1	4	10	W. 1	W. 3	S. W. 1	0
5	.24	.26	.21	.25	.05	78½	85	78	78	79	7	9	5	0	10	0	S. 1	E. 1	0
6	.26	.27	.25	.30	.05	76½	82	81	76	78	6	7	6	1	0	S. 1	0	0	0
7	.30	.33	.34	.35	.05	76	79	78	76	79	3	0	0	0	0	0	S. E. 1	0	0
8	.35	.36	.32	.35	.03	75½	77+	83½	79½	79	8	0	0	9	10	N. E. 1	E. 1	S. E. 1	0
9	.36	.37	.31	.32	.05	77	84	84	80	81	7	2	5	4	10	0	S. E. 1	S. 1	0
10	.35	.35	.28	.34	.07	79	86	85	79½	82	7	8	1	4	10	0	S. W. 1	S. 2	0
11	.32	.32	.30	.21	.08	77	84	78	75½	78	7	6	5	0	0	0	S. W. 2	W. 1	0
12	.23	.24	.20	.22	.04	71	75	78½	76	78	5	0	0	0	8	W. 1	W. 1	W. 1	S. W. 1
13	.25	.28	.23	.26	.05	74½	73	79½	77½	76	7	0	0	1	0	S. W. 1	S. W. 1	S. 1	S. W. 2
14	.28	.27	.21	.25	.04	76	80	82	78	79	6	0	1	0	5	W. 2	S. W. 2	S. W. 3	0
15	.25	.27	.20	.22	.07	78	81	83	80	81	6	5	4	1	8	S. W. 2	N. 3	E. 3	0
16	.19	.21	.17	.18	.04	78	85	83	77½	81	8	2	2	0	3	S. W. 3	S. N. 3	S. W. 4	S. W. 3
17	.20	.21	.21	.26	.06	78	85	87	80	82	9	1	6	8	10	N. W. 2	N. W. 2	N. E. 2	S. W. 1
18	.28	.33	.28	.32	.05	77	85	88	80½	82	11	1	6	8	10	S. W. 1	N. W. 1	S. 2	S. W. 1
19	.34	.35	.35	.30	.02	78	85	86½	81	82	8	1	6	3	8	0	S. E. 1	S. E. 1	0
20	.37	.35	.33	.32	.05	78½	86	89	82	83	11	1	6	8	9	0	S. SW. 3	S. W. 3	S. W. 2
21	.30	.31	.29	.22	.09	79	87	79	76½	80	8	8	8	0	6	S. W. 1	W. 2	N. W. 2	S. W. 1
22	.22	.23	.....	.....	..	74½	76	78	....	..	4	1	2	..	..	E. 2	0	....	....
23	21	.....	.....	.....	..	76	....	....	....	..	..	1	..	..	..	N. W. 1	....	....	....
24	.....	.....	.....	.....	..	....	....	....	....	..	..	..	..	..	..	....	....	....	....
25	28	.....	.....	.....	..	79	....	....	78	..	..	1	..	..	..	S. W. 1	....	....	....
26	.....	.22	.....	.20	.02	....	78	....	79	..	..	..	..	..	0	....	....	....	....
27	.22	.35	.18	.23	.17	75½	76	78	75	76	3	1	0	0	0	0	....	W. 1	....
28	.27	.31	.30	.33	.06	71	76	81	78	76	10	..	..	..	..	N. 1	....	....	....
29	.26	.28	.31	.34	.08	75	83½	86	78	80	17	10	..	0	10	S. 1	....	S. 3	0
30	.....	.33	.30	.32	.03	79	85½	79	79	80	7	.	..	0	10	....	....	N. W. 2	0
31	.32	.32	.....	.21	.11	77½	85	82	79	80	8	10	..	..	10	N. E. 1	....	....	....
Totals,...	81701	84784	72621	81715		2152	2292	2019	2036		193	107	79	61	177	N. 3=¾d	N. E. 5=1¼	E. 5=1	S. E. 6=1½ calm 26=6½
Averages,	30.260	30.280	30.258	30.264		78.85	82.03	82.18	75.41		7.14	3.81	2.43	2.54	6.80	S. 13=3¼	S. W. 24=6	W. 9=2¼	N. W. 6=1½
Force																N. 2.33	N. E. 1.20	E. 1.60	S. E. 1.00
																S. 1.69	S. W. 1.83	W. 1.33	N. W. 1.66
Total do........	30.265					79.88						4.14				1.58			

Day of Month.	Temperature of Evaporation & Dew Point at Sun Rise: Temperature of Evaporation.	Dew Point.	At 3, P. M.: Temperature of Evaporation.	Dew Point.	At 9, P. M.: Temperature of Evaporation.	Dew Point.	Range.	Daily Humidity.
1	76	75.6	78	75.5	78	77.3	1.8	.954
2	78	77.6	76	74.0	76	75.3	3.0	.902
3	....	....	75	72.5	78	77.0	4.5	.815
4	77	76.6	77½	75.0	78	77.6	2.6	.820
5	76	75.3	76	75.5	76	75.3	0.0	.939
6	76	76.0	77	75.0	74	73.2	2.8	.917
7	75½	76.0	75	73.9	75	74.6	2.1	.914
8	71	73.0	75	72.2	77	76.3	4.1	.814
9	74	71.4	77	74.7	78	77.3	5.9	.837
10	76	75.0	77	71.4	77	76.3	1.9	.834
11	76	75.6	75	73.9	74	73.0	2.0	.939
12	72	71.1	74	72.5	74	73.2	2.1	.883
13	73	72.6	77	76.9	76	75.6	3.7	.930
14	74	73.2	78	76.7	77	76.8	3.6	.904
15	77	76.8	77	75.0	78	77.3	2.3	.883
16	76	75.3	78	75.4	76	75.6	1.1	.894
17	77	76.8	76	72.4	78	77.3	4.9	.897
18	76	75.6	77	73.5	78	77.3	3.8	.821
19	76	75.3	78	75.5	78	77.0	1.7	.927
20	76	76.8	76	73.2	78	76.7	3.6	.792
21	76	75.0	76	75.0	75	74.6	0.4	.992
22	74	71.0	....	....	....	....	...	...
23	73	73.2	....	....	....	....	...	...
24								
25	77	76.3	....	....	78	78.0	1.7	.988
26	....	....	....	....	....	....	...	...
27	74	73.6	75	73.9	75	75.0	1.4	.850
28	68	66.5	78	77.0	76	75.3	10.5	.887
29	74	73.6	82	80.0	76	75.3	7.3	.894
30	....	....	76	75.0	78	77.6	2.6	.929
31	76	75.6	78	76.7	78	77.6	1.0	.912
Totals,............	2029	20140	1991	18476	2070	18940	824	..
Averages,............	75.14	71.59	76.69	71.06	76.66	70.11	3.05	...
Total Averages,............	....	....	....	72.13	....	....	..	...
Drying power,............	....	2.26	....	11.12	....	5.27	...	...
Average do............	....	....	....	6.21	....	....	...	...
Average temp. of Evaporation,...	....	....	....	76.16	....	....	...	...

Radiant Thermometer in Sun.

Average Radiation at Sun Rise was found to be,........ 0.30.
9, A. M. do........ 25°.00.
12, M. do........ 35.15
3, P. M. do........ 26.78
9, P. M. do........ 1.67
do. do. do. do.
do. do. do. do.

Pluviometer.—Rain. Date.	Began.	Ended.	Quantity.
1st	8.52 A.M. 11.09 A.M.	9 A.M. 11.16 A.M.	.079
2d	3.05 P.M. Showers before day	3.20 P.M.	.193
3d	11.35 A.M. 8.30 A.M.	11.40 A.M. 8.10 A.M.	.326
5th	9.38 A.M. 10.35 A.M. 12.26 P.M. 1.52 P.M.	9.43 A.M. 11.05 A.M. 12.38 P.M. 3.50 P.M.	3.225
6th	10.32 A.M. 5.38 P.M.	10.48 A.M. 6.00 P.M.	.200
7th	Gentle Showers. 12 M.	12.30 P.M.	.023
8th	12.28 P.M.	12.32 P.M.	.081
11th	12.23 P.M. 2.00 P.M. 3.00 A.M.	12.35 P.M. 3.30 P.M. 3.30 A.M.	.387
12th	8.15 A.M.	10 A.M.	.362
13th	8.30 A.M. 3.02 P.M.	11.20 A.M. 3.12 P.M.	1.354
14th	3.15 P.M.	3.50 P.M.	.335
21st	2.52 P.M. 4.00 A.M.	4.30 P.M. 5.45 A.M.	1.300
22d	8.00 A.M.	8.30 A.M.	.245
25th	6.10 P.M.	6.50 P.M.	.391
27th	5.25 A.M. 2.25 P.M. 7.00 P.M.	6.00 A.M. 4.00 P.M. 9.30 P.M.	1.360
29th	3.15 P.M.	3.18 P.M.	.680
31st	1.35 P.M.	2.15 P.M.	.067
Total,............			11.708

Daily & Weekly Mortality from Yellow Fever	Ditto from other Diseases	Total Daily & Weekly Mortality	Height of River below High Water Mark, which is usually about Fifteen Feet
4	24	28	1 feet on 2nd
From 1st to 8th, 59	129	188	5.10 on 10th,
to 13th, 204	110	314	6 feet on 17th
to 22d, 429	188	617	
to 26th, 297	84	381	6.6 on 24th
Daily, 100	24	124	
87	18	105	
128	26	154	
137	20	157	
109	33	142	7.6 on 31st
1.554	686	2240	

REMARKS.

The record this month has been kindly kept for me by Dr. N. Benedict.
Much thunder and lightning during the month.
Heavy rains, alternated with hot sun. Much damp weather
Thunder and lightning noted particularly on the 5th, 12th, 13, and 29th

RECAPITULATION.

	Barometer.	Thermometer.	Dew Point.	Degree of dryness on the Thermometric Scale.	Degree of Moisture on the Hygrometric Scale, 1000 being sat.
Maximum,............	30.37	89	80.0	15.8	0. or sat. 5 obs.
Minimum,............	30.11	71	66.5	0. or sat. 5 obs.	.610
Average,............	30.265	79.88	72.13	6.21	.825
Range,............	.26	18	14.4	15.8	.390
Average of daily range,......	5.07	7.14	3.05	....	....

ASPECT OF SKY.

Average	
At Sun Rise,............	3.81
9, A. M............	2.43
Midday,............	2.54
9, P. M............	6.80
Average total,	4.14

QUANTITY OF RAIN

In inches and fractions,	11.708
No. of days on which Rain fell,	18
" nights " " "	4

WINDS.

No. of days blowing,

	Direction.	Force.
From the N.	6¾	2.33
" N. E.	1¼	1.20
" E.	1¼	1.60
" S. E.	1½	1.00
" S.	3¼	1.69
" S. W.	6	1.83
" W.	2¼	1.33
" N. W.	1½	1.66
No. of days calm,	6½	
Average total,		1.58

HYGROMETRIC CALCULATIONS.

	At Sunrise.	At Midday.	At 9, P. M.	Average.
Amount of Moisture.	.930	.703	.842	.825
Elasticity of the Vapor.	.863	.796	.773	.820
Weight of Vapor in a cubic foot in grains.	9.600	8.180	8.315	8.798

"D." Meteorological Register, for New Orleans, kept by E. H. Barton.

AUGUST, 1853. LATITUDE, 30°. LONGITUDE, 90°.

Altitude of Thermometer above the Earth 5 feet
do of Rain Gauge, 15 feet
do of Barometer above the sea, 11 ft. 141

Explanation.

ASPECT OF SKY.—0 Represents entire cloudiness, 1 " a slight degree of clearness, and so on, until 10, " which represents entire clearness.

WINDS.—0 Signifying calm, 1 a very gentle breeze, 2 a gentle breeze, 3 a fresh breeze, 4 a strong wind, 5 a very do do, 6 a violent storm.

Day of Month	Barometer at Sun Rise	Barometer 9 A. M.	Barometer 3 P. M.	Barometer 9 P. M.	Barometer Range	Thermometer (outside, in open air, in shade, at) Sun Rise	Thermometer 9 A. M.	Thermometer 3 P. M.	Thermometer 9 P. M.	Thermometer Average	Thermometer Range	Aspect of Sky at Sun Rise	Aspect of Sky 9 A. M.	Aspect of Sky 3 P. M.	Aspect of Sky 9 P. M.	Anemometer, Course and Force of Wind at Sun Rise	Anemometer 9 A. M.	Anemometer 3 P. M.	Anemometer 9 P. M.
1	30.30	30.29	30.27	30.28	.03	77°	85°	83°	80°	81	8	10	....	....	..	N. E. 1	....	....	....
2	.27	......	......	.21	...	77½	......	......	80	..	....	10	....	....	..	W. 1	S. W. 2	....	....
3	......	......	......	......	...	......	......	......	82	..	....	..	....	....	..	....	....	....	....
4	......	......	......	.19	...	77	86	88	82	83	11	....	....	....	10	....	....	....	W. 1
5	30.20	.22	.18	.17	.05	77	86	88	82	83	11	10	7	3	10	W. 1	N. 2	W. 2	N. 1
6	.19	.23	.20	.19	.04	77	84	85	79	81	8	10	10	0	0	N. W. 1	N. W. 3	N. E. 2	E. 2
7	21	.23	.22	.20	.03	78	83	79	79	79	5	3	1	4	10	E. 1	E. 2	E. 2	0
8	.21	24	.21	.22	.03	77	84	87	80	82	10	10	9	8	10	E. 1	E. 1	E. 2	0
9	.20	.25	.22	.23	.05	77	87	75	77	79	12	10	9	0	10	0	E. 2	E. 1	0
10	.26	.26	.24	.26	.02	77	84	74	76	77	7	8	9	0	9	E. 1	E. 2	E. 2	0
11	.29	.29	.22	.23	.07	75	80	85	78	78	6	9	9	0	4	0	N. 1	N. E. 1	S. 1
12	.24	.25	.21	.18	.07	76	83	85	78	80	9	8	6	1	0	0	E. 2	E. 1	0
13	.20	.23	.17	.15	.08	75	77	83	78	78	8	3	0	2	10	N. E. 2	N. E. 2	E. 3	E. 2
14	.18	.21	.17	.18	.04	75	84	83	78	80	9	8	7	0	10	0	E. 1	E. 2	0
15	.21	.24	.18	.21	.06	75	82	78	75	77	7	8	0	0	8	0	W. 1	0	E. 1
16	.17	.19	.15	.13	.06	75	80	83	73	77	8	0	1	0	8	0	W. 1	W. 1	0
17	.11	.12	.06	.04	.06	72	77	82	76	76	10	8	0	2	8	W. 2	W. 2	W. 1	N. W. 1
18	.07	.10	.08	.07	.03	74	83	83	77	79	9	10	5	0	6	0	W. 1	W. 1	0
19	.09	.12	.07	.18	.05	71	84	87	82	81	13	10	10	10	8	W. 1	W. 2	N. W. 2	W. 2
20	.09	.11	.11	.09	.02	79	86	91	76	83	15	10	8	6	8	W. 2	W. 2	N. 2	N. 1
21	.14	.17	.13	.14	.03	75	84	88	82	82	13	10	8	10	10	N. E. 2	W. 1	N. 1	S. 2
22	.16	.22	.20	.17	.06	89	84	76	76	79	8	8	3	0	0	W. 1	N. E. 2	N. 1	N. 2
23	.18	.22	.19	.18	.04	75	82	87	81	81	12	3	1	0	10	N. 1	N. E. 1	N. E. 2	E. 3
24	.17	.21	.16	.15	.06	76	85	89	81	82	13	10	8	10	0	S. E. 1	N. E. 1	N. E. 2	S. E. 3
25	.19	.21	.18	.18	.03	77	84	86	81	82	9	2	5	9	8	S. E. 1	S. E. 1	S. E. 1	S. 1
26	.21	.25	.22	.25	.04	78	85	84	84	82	7	9	8	2	10	1	E. 1	E. 2	E. 2
27	.26	.29	.22	.27	.07	78	86	86	80	82	8	9	7	0	10	E. 1	N. E. 2	E. 2	E. 2
28	.23	.28	.24	.24	.05	76	75	85	79	78	10	4	0	2	10	N. E. 3	E. 1	E. 2	E. 1
29	.21	.26	.23	.24	.05	77	85	87	79	82	10	0	2	10	10	E. 2	E. 3	N. E. 3	E. 2
30	.23	.27	.22	.23	.05	77	85	86	78	81	9	10	10	10	10	N. E. 3	E. 3	E. 3	E. 2
31	.16	.17	.13	.13	.04	75	81	86	80	81	11	9	10	8	10	N. E. 3	N. E. 2	N. E. 3	E. 2
Totals,	87563	84623	81598	87527	131	2212	2327	2347	2284	....	265	219	152	97	277	N. 9=2¼	N.E. 17=4¼	E. 36=9	S. E. 6=1½ calm 17=4¼
Averages,	30.191	30.222	30.181	30.181	4.08	76.27	83.10	83.82	78.75	....	9.16	7.55	5.62	3.16	7.75	S. 3=¾	S.W. 0=0	W. 20=5	N.W. 4=1
																N. 1.33	N. E. 2	E. 1.88	S. E. 1.50
																S. 1.33	S. W. 0.0	W. 1.20	N. W. 1.75
Total do.	30.194					81.25						6.31				1.33			

	Temperature of Evaporation at Sun Rise	Dew Point at Sun Rise	Temperature of Evaporation at 3 P. M.	Dew Point at 3 P. M.	Temperature of Evaporation at 9 P. M.	Dew Point at 9 P. M.	Range.	Daily Humidity.		Radiant Thermometer in Sun, at Sun Rise	9 A. M.	12 M.	3 P. M.	9 P. M.	Pluviometer; Rain. Began.	Ended.	Quantity	Daily Mortality from Yellow Fever	Ditto from other Diseases.	Total Daily Mortality	Height of River below High Water Mark, which is usually about Fifteen Feet
1	75	74.2	80	77.1	78	77.3	3.1	.887		75	89	......	......	80				117	18	135	
2	76	75.6	....	......	78	75.6	....	.943		78	......	......	......	88	12.58 P.M.	1.20 P.M.	.065	125	26	151	
3	....	.....	....	......	......	......	....	....		....	......	......	......	.....	12.10 P.M.	1.05 P.M.	.671	127	23	150	
4	....	.....	....	......	80	79.4	...	.922		....	......	......	......	80				132	23	155	
5	77	77.0	80	77.4	79	78.1	1.1	.957		76	97	98	100	80				198	40	238	9 ft. 2 in
6	77	77.6	78	75.8	78	77.6	1.8	.967		76	97	107	108	79				166	43	209	
7	77	76.8	77	76.3	79	79.0	3.7	.954		78	.....	131	111	79	12.30 P.M.	1.20 P.M.	.680	196	32	228	
8	76	75.6	78	75.2	79	78.6	3.4	.859		77	96	127	111	80				176	36	212	
9	76	75.6	75	75.6	77	77.0	2.6	.890		76	116	120	.....	77	1.20 P.M.	2.20 P.M.	.980	189	40	229	
10	77	77.0	74	74.0	76	76.0	3.6	.990		76	119	117	.....	.....	12 M.	1.30 P.M.	.080	197	20	217	
11	75	73.0	77	75.6	77	76.8	1.8	.926		75	.....	114	.....	78	2.20 P.M.	3.15 P.M.	.550	193	32	225	
12	76	76.0	78	75.3	74	72.5	3.5	.854		75	110	117	.....	78	12 M.	1. P.M.	.150	173	31	204	
13	72	70.7	73	69.2	75	73.9	4.7	.790		75	.....	.....	.....	78				196	36	232	9 ft. 10 in.
14	74	73.6	76	74.6	76	75.5	1.7	.970		75	128	126	.....	78				193	30	223	
15	74	73.6	77	76.8	74	73.6	2.2	.956		75	.....	.....	.....	75	10.20 P.M.	12.20 P.M.	.720	191	31	222	
16	74	73.5	77	75.6	73	73.0	2.0	.886		75	.....	118	.....	.....	3.15 P.M.	3.55 P.M.	1.100	193	26	219	
17	72	72.0	77	75.3	74	73.2	3.3	.904		72	.....	131	128	76	4.30 P.M.	6. P.M.	.200	191	28	219	
18	74	74.0	77	75.0	75	74.2	1.0	.899		74	125	120	.....	77	11.30 A.M.	11. A.M.	.350	208	26	234	
19	73	72.6	77	73.8	80	79.4	6.8	.834		74	137	148	13.	82				192	37	229	
20	78	77.6	77	72.7	73	71.8	5.8	.787		79	130	132	129	75	3.45 P.M.	4 P.M.	.340	235	34	269	11 ft
21	73	72.2	79	76.3	79	78.1	5.9	.836		74	120	132	132	81				244	39	283	
22	79	78.6	77	74.6	72	70.3	7.3	.914		89	.....	.....	.....	75	7. A.M.	8.30 A.M.	.250	224	34	258	
23	75	75.0	77	73.8	78	77.0	3.2	.845		74	.....	112	.....	81	12 M.	12.30 A.M.	.420	191	31	222	
24	75	74.6	79	76.6	78	77.6	2.4	.811		76	105	118	115	81				190	28	218	
25	76	75.6	78	75.5	79	78.3	2.8	.856		77	105	112	121	81				155	38	193	
26	77	76.8	79	77.5	79	78.3	1.5	.897		78	110	100	.....	81				153	32	185	
27	77	76.8	75	71.2	77	76.6	5.2	.811		78	112	.....	.....	80				119	29	148	12 ft
28	75	74.6	78	75.8	77	76.3	1.7	.868		75	.....	.....	.....	79	12. M	2.30 P.M.	.110	90	15	105	
29	75	74.2	77	73.8	77	76.3	2.5	.821		77	105	100	110	79	6.45 A.M.	8. A.M.	.450	117	22	139	
30	74	72.8	74	69.7	73	71.0	3.1	.721		77	102	110	112	78				100	37	137	
31	69	66.2	76	72.7	76	74.6	8.3	.743		75	102	112	94	80				98	21	119	
Totals,	2178	21649	2157	22915	2290	22919	9.19	....	Totals,	2202	2105	2632	1502	2118	....	....	7.016	5269	938	6207	....
Averages,	75.10	74.67	76.9	74.61	76.33	75.92	4.35	....	Avr. exposed	75.90	110.	119.63	115.53	78.41	....	....	.....	.....	....	....	....
Total Averages,	....	....	....	75.08	....	....	....	....	Avr. in shade	76.29	84.57	85.36	86.23	79.97	....	....	.....	.....	....	....	....
Drying power,	....	1.62	....	9.13	....	2.8	....	....	Difference, or radiation	.30	27.43	34.27	29.30	.63	....	....	.....	.....	....	....	....
Average do.	....	....	....	4.52	....	....	....	....													
Average temp. of Evaporation,	....	....	....	76.13	....	....	....	....													

REMARKS.

Much thunder and lightning throughout the month; during the intervals of the heavy rains, a burning sun, cold in shade; hot, damp, suffocating air; more "calms" than ever observed before; the average "force" of the wind very small, 1.33 by the scale. (8th,) Wind to-day occasionally from North.

The gutters, where any stagnant water left twelve hours after a rain, had gas bubbling up from below, turbid, discolored. (12th,) Rains partial, in different parts of city. (20th,) Rain to-day, accompanied with sharp blow from East.

Fogs in the neighborhood have been heavy every morning. The "clearness" of the sky, has greatly predominated during the "sunrise," and 9, P. M. observation, over those of 9 and 3 o'clock.

RECAPITULATION.

	Barometer.	Thermometer.	Dew Point.	Degree of dryness on the Thermometric Scale.	Degree of Moisture on the Hygrometric Scale, 1000 being sat.
Maximum,	30.29, on 1st, 11, 24,	91 on 20th,	79.4 on 19th,	18.3 on 20th,	0, or sat. 14 ds.
Minimum,	30.04 on 17th,	72 on 17th,	66.2 on 31st,	0, or sat., 14 ds.	.532 on 20th,
Average,	30.191	81.25	75.08	4.52	.873
Range,	.25	19.	13.2	18.3	118
Average of daily range,	....	9.16	3.35	....	....

ASPECT OF SKY.	
Average At Sun Rise,	7.55
9, A. M.	5.62
Midday,	3.45
9, P. M.	7.75
Average of total,	6.34

QUANTITY OF RAIN	
In inches and fractions,	7.016
No. of days on which Rain fell,	11
" nights " " "	0

WINDS. No. of days blowing,	Direction.	Force.
From the N.	2¼	1.33
" N. E.	4¼	2.11
" E.	9	1.88
" S. E.	1½	1.52
" S.	0¾	1.33
" S. W.	0	0
" W.	5	1.20
" N. W.	1	1.75
No. of days calm,	17	
Average total,		1.33

HYGROMETRIC CALCULATIONS.	At Sunrise.	At Midday.	At 9, P. M.	Average.
AMOUNT OF MOISTURE.	.950	.756	.915	.873
ELASTICITY OF THE VAPOR.	.897	.897	.931	.909
WEIGHT OF VAPOR IN A CUBIC FOOT IN GRAINS.	9.651	9.515	10.045	9.737

"E."

Meteorological Register, for New Orleans, kept by E. H. Barton.

SEPTEMBER, 1853. LATITUDE, 30°. LONGITUDE, 90°.

Altitude of Thermometer above the Earth 5 feet.
do of Rain Gauge, ... 15 feet.
do of Barometer above the sea, ... 31 ft 141

Explanation.

ASPECT OF SKY.—0 Represents entire cloudiness, 1 " a slight degree of clearness, and so on, until 10, " which represents entire clearness.

WINDS.—0 Signifying calm, 1 a very gentle breeze, 2 a gentle breeze, 3 a fresh breeze, 4 a strong wind, 5 a very do. do., 6 a violent storm.

Day of Month.	Barometer at Sun Rise.	9 A. M.	3 P. M.	9 P. M.	Range.	Thermometer (outside, in open air, in shade, at) Sun Rise	9 A. M.	3 P. M.	9 P. M.	Average.	Range.	Aspect of Sky at Sun Rise.	9 A. M.	3 P. M.	9 P. M.	Anemometer, Course and Force of Wind at Sun Rise.	9 A. M.	3 P. M.	9 P. M.
1	30.10	30.32	30.11	30.10	02	77	79	82	79	79	5	0	0	0	10	N 2	N.E. 2	E. 3	E. 2
2	.08	.13	.10	.12	05	76	78	80	79	78	4	0	0	0	8	N E. 2	N.E. 3	N.E 3	E. 3
3	.13	.16	.11	.10	06	76	83	85	80	81	9	10	7	0	10	E. 2	N.E. 2	S.E. 3	E. 1
4	.05	.06	.03	.12	04	77	84	79	76	79	7	1	8	0	8	0	N 2	N. 4	E. 1
5	.05	.08	.07	.11	06	74	77	82	77	77	8	0	1	4	10	E. 1	S E. 1	E. 2	E. 1
6	.10	.13	.08	.10	05	76	77	80	76	77	4	0	0	0	10	S E. 2	S E. 2	E. 2	E. 1
7	.11	.11	.08	.12	04	75	83	80	77	78	5	10	8	0	10	E. 1	E. 2	N.E. 3	E. 1
8	.11	.14	.10	.08	06	77	81	81	77	79	4	6	6	2	10	N E. 2	N.E. 2	E. 2	E. 2
9	.07	.07	.02	.06	07	75	80	81	76	78	6	10	1	0	0	0	S.E. 1	E. 2	S.E. 1
10	.10	.14	.12	.18	08	76	77	74	75	78	3	0	1	0	0	0	N E. 2	W. 1	N. 3
11	.18	.21	.20	.22	04	75	76	79	76	76	4	0	0	10	1	N.E 2	0	W. 1	E. 1
12	.21	.29	.21	.27	08	76	81	75	75	76	6	0	6	0	10	E. 1	E. 2	S E. 2	E. 2
13	.24	.26	.18	.23	08	77	80	84	76	78	9	1	0	0	10	E. 1	E. 2	E. 2	0
14	.16	.19	.14	.16	05	74	81	87	78	79	11	10	6	10	10	0	W 2	W. 2	S.W. 2
15	.17	.21	.16	.20	05	75	82	86	80	80	11	10	9	10	10	0	S.W. 1	W 1	N.W. 2
16	.22	.26	.22	.22	04	76	82	85	80	80	9	10	8	7	10	0	S W. 1	E. 2	E. 1
17	.21	.26	.21	.20	05	76	82	81	79	80	10	10	8	2	10	0	S E. 1	S.E. 2	E. 2
18	.20	.23	.15	.18	08	75	81	85	79	80	10	10	8	1	10	0	E. 1	E. 2	E. 2
19	.17	.24	.18	.21	07	76	80	79	77	78	4	1	0	0	0	E. 1	W. 1	E. 2	0
20	.21	.28	.24	.27	04	74	73	78	70	73	8	0	0	0	0	N. 3	N. 3	N.E. 3	N.E. 1
21	.21	.28	.21	.27	07	67	74	77	69	71	10	2	10	1	10	N E. 1	N. 3	N. 3	N. 3
22	.28	.32	.23	.25	09	60	64	70	67	65	10	10	10	10	10	N. 3	N. 3	N. 3	N. 3
23	.27	.28	.25	.27	03	60	66	71	64	65	11	10	10	10	10	N. 4	E. 2	N.E. 3	W. 1
24	.27	.31	.25	.27	06	61	68	75	66	67	14	10	10	10	10	N.E. 2	E. 2	N.E. 2	N. 1
25	.27	.29	.26	.28	03	65	74	78	70	71	13	10	10	10	10	N.E. 1	E. 3	E. 2	E. 1
26	.30	.33	.31	.32	03	67	77	81	73	74	14	10	10	7	10	E. 3	E. 3	E. 3	E. 1
27	.31	.32	.28	.39	04	69	76	82	73	75	13	10	10	10	10	N E. 2	E. 2	E. 3	E. 1
28	.27	.30	.23	.23	07	71	76	82	72	75	11	10	10	3	10	N.E. 1	N. 3	E. 3	E. 1
29	.21	.25	.22	.24	04	68	78	83	73	75	15	10	10	10	10	0	N 2	E. 2	E. 1
30	.23	.26	.22	.23	04	69	78	83	70	76	11	10	10	2	0	N.E. 1	E. 3	E. 3	E. 2
Totals,	90556	90651	90519	90577	159	2169	2328	2408	2168	..	263	174	169	118	227	N. 4½ / S. 0	N.E. 5 / S.W. 0¾	E. 12½ / W. 1¾	S E. 2¼ / N.W. 0¼; calm, 3 (Directions)
Averages,	30.185	30.217	30.173	30.192	.0529	72.30	77.60	80.26	74.75	..	8.76	5.70	5.63	3.93	7.56	N. 2.52 / S 0	N.E. 2.05 / S.W. 1.33	E. 1.56 / W. 1.28	S.E 1.66 / N.W. 2 (Force)
Total do.,	30.191					76.23						5.70				1.62			

Day	Psychrometer at Sun Rise: Temperature of Evaporation	Dew Point	At 3, P. M.: Temperature of Evaporation	Dew Point	At 9, P. M.: Temperature of Evaporation	Dew Point	Range.	Average Daily Humidity.
1	74	72.8	76	73.9	76	75.1	2.2	.843
2	74	74.6	77	76.0	77	76.3	1.7	.809
3	75	74.6	77	74.4	78	77.3	2.9	.851
4	76	75.6	73	70.7	77	74.6	4.9	.888
5	74	74.0	77	75.3	75	74.2	1.3	.905
6	75	74.5	77	76.6	75	74.7	2.1	.931
7	75	75.0	77	76.6	77	77.0	2.4	.974
8	76	75.6	79	78.3	76	75.6	2.7	.944
9	75	75.6	78	77.0	76	76.0	2.0	.959
10	75	74.5	74	74.0	75	75.0	1.0	.988
11	74	73.5	77	76.3	76	76.0	2.5	.958
12	74	74.6	75	75.0	74	73.1	1.9	.902
13	75	75.0	77	74.7	75	74.5	0.5	.890
14	74	74.0	77	74.4	77	76.8	2.8	.881
15	74	73.6	77	74.1	78	77.8	4.2	.848
16	75	74.6	77	74.4	78	77.3	2.9	.857
17	76	76.0	78	75.5	77	76.3	0.8	.871
18	75	75.0	77	74.1	77	76.3	1.9	.870
19	75	74.8	75	73.5	75	74.2	1.3	.900
20	73	72.6	67	61.0	68	67.0	11.0	.797
21	65	63.8	67	62.1	62	57.5	6.3	.880
22	56	52.4	61	55.0	61	56.9	4.5	.705
23	53	50.3	59	50.5	62	60.0	10.3	.689
24	59	57.4	65	59.5	65	64.4	7.0	.800
25	63	61.7	68	63.3	67	65.4	3.7	.782
26	63	60.5	74	71.4	70	69.1	10.9	.803
27	67	66.0	73	69.6	71	70.1	4.1	.815
28	70	69.5	71	66.5	70	69.1	7.0	.804
29	67	66.4	71	66.1	70	75.4	1.0	.755
30	68	67.4	75	72.2	74	73.2	5.8	.847
Totals,	2197	21054	2208	21227	2187	21760	1134	....
Averages,	70.90	70.18	73.53	70.75	72.90	71.86	3.78	...
Total Averages,				70.93				
Drying power,		2.12		9.51		2.90		
Average do.				4.84				
Average temp. of Evaporation,				72.41				

Day	Radiant Thermometer in Sun, at Sun Rise.	9, A. M.	12, M.	3, P. M.	9, P. M.	Daily Mortality from Yellow Fever.	Ditto from other Diseases.	Total Daily Mortality.	Height of River below High Water Mark, which is usually about Fifteen Feet
1	77	....	....	....	....	107	28	133	
2	75	....	....	....	79	90	26	116	
3	75	109	120	....	78	91	19	110	
4	77	114	121	....	....	71	27	98	
5	74	112	....	106	....	66	29	95	
6	76	....	....	....	75	49	21	70	
7	75	106	....	....	77	49	12	61	
8	77	....	....	105	77	44	20	64	12 ft.
9	75	104	....	....	....	57	23	80	
10	77	....	....	....	75	44	24	68	
11	75	....	....	....	76	37	20	55	
12	76	....	....	....	75	26	21	47	
13	75	....	114	118	76	33	12	45	
14	74	100	114	114	78	32	20	52	
15	77	111	114	114	80	31	20	51	
16	76	100	111	112	80	24	23	47	
17	76	114	114	113	79	29	18	47	12 ft. 8 in.
18	77	113	118	....	79	21	13	34	
19	....	....	....	....	77	29	20	49	
20	....	....	....	....	70	15	22	37	
21	67	99	105	....	69	17	17	34	
22	59	81	88	88	67	11	17	38	
23	59½	99	90	104	64	10	24	34	
24	61	96	86	102	66	15	20	35	12 ft. 6 in.
25	69½	97	104	106	70	17	23	40	
26	67	97	101	95	72	12	21	33	
27	69	97	104	113	73	12	17	29	
28	70	103	106	....	72	11	24	35	
29	67	100	110	113	73	9	7	16	
30	68	98	98	....	76	11	20	39	11 ft. 6 in.
Totals,	2158	2070	1921	1508	1857	1066	608	1691	....
Avr. exposed.	71.66	103.	106.72	107.71	74.28	....	....	....	....
Avr. in shade	72.30	77.30	80.94	79.92	76.40	....	....	....	....
Difference, or radiation	0.64	25.70	25.78	27.97	2.12	....	....	....	....

Pluviometer;—Rain.

Date.	Began.	Ended.	Quantity.
1..	4. A.M.	5. A.M...	.250
2	5. A.M.	8. A.M.	.025
	10.30 A.M.	2.30 P.M.	.100
4..	2.50 P.M.	3 45 P.M...	1.450
5	5.30 A.M.—showers, 12.30 P.M.	12.50	.150
6..	Showers at 11 & 3...		.220
7	3.30 P.M. Showers..........	4. P.M.	.080
8	In night..........	showers to 2 P.M.	.200
9	In night..........		.060
	Showers to 1 P.M....		.100
10	Showers to 12 M....	do. to 5 P.M....	.680
11..	Occasional showers..		.100
12	12.30 P.M.	3.29 P.M.	.800
	4. P.M.—showers,		
13..	4.5 P.M.	4.55 P.M...	.600
20	Showers light in night........		.050
21..	7. A.M.	9. A.M...	.130
Totals	....	....	5.045

REMARKS.

The occurrence of thunder and lightning continued as long as the rains.

The North winds, and cool dry weather, occurred soon after the middle of the month, greatly abating the epidemic.

RECAPITULATION.

	Barometer.	Thermometer.	Dew Point.	Degree of dryness on the Thermometric Scale.	Degree of Moisture on the Hygrometric Scale, 1000 being sat.
Maximum,..........	30.33 on 26th,	87 on 15th, 17th,	78.3 on 8th,	20.7 on 23d,	0, or sat. 14 obs.
Minimum,..........	30.02 on 9th,	60.22 on 22-23d,	50.3 on 23d,	0. or sat., 14 obs.	.502 on 23d,
Average,..........	30.191	76.23	70.93	4.84	.857
Range,..........	.31	26.	28.	20.7	.498
Average of daily range,....	.0529	8.76	3.78	....	....

ASPECT OF SKY.

Average:
- At Sun Rise,.......... 5.70
- 9, A. M.......... 5.63
- Midday,.......... 3.93
- 9, P. M.......... 7.56

Average of total,.......... 5.70

QUANTITY OF RAIN

In inches and fractions,...... 5.045
No. of days on which Rain fell, 14
" nights " " " 3

WINDS.

No. of days blowing,

	Direction.	Force.
From the N.	4½	2.52
" N. E.	5	2.05
" E.	12½	1.56
" S. E.	2¼	1.66
" S.	0	0.
" S. W.	0¾	1.33
" W.	1¾	1.28
" N. W.	0¼	2.00
No. of days calm,	3	
Average total,..........		1.62

HYGROMETRIC CALCULATIONS.

	At Sunrise.	At Midday.	At 9, P. M.	Average.
AMOUNT OF MOISTURE.	.932	.732	.908	.857
ELASTICITY OF THE VAPOR.	.775	.782	.816	.781
WEIGHT OF VAPOR IN A CUBIC FOOT IN GRAINS	8.402	8.473	8.828	8.567

ratory of nature; if they are hidden from us to-day, their application may be made by our successors to-morrow. We can no longer plead ignorance of their practical bearing and importance; but, we are, as yet, upon the mere shores of meteorological science, "picking up the few pebbles" of truth that have been yielded to perseverance and industry, while the boundless ocean lies open before us, for exploration and discovery.

SECTION VII.

THE SECOND CONSTITUENT OF AN EPIDEMIC.—THE TERRENE.

Proposition—The Upturning of the Original Soil, together with Filth of all Kinds—The sine qua non of all our Epidemics—Proofs as far back as Sixty Years, to the Present Period—How first noticed by me—Causes of Epidemics at Natchez, Memphis, St. Francisville, Mobile, Selma, Algiers, &c., &c.—For an Endemic less necessary—For Bilious and Periodic Fevers still less, but all the same!—Why Yellow Fever does not always extend—We Know as much of the Origin of Yellow Fever as we do of any other Fever—All Countries have their Peculiar Diseases—Parallel of Yellow Fever and Plague—Extension of the Epidemic due to late Inundations in Part—At what Stage, Swamps most Dangerous—Proofs from Foreign Countries and here—Different Stages of Draining Produce Different Diseases—How and When to Drain Land, &c.

Our other constituent to produce the yellow fever epidemic, the other blade of the "shears," is the TERRENE. This is very comprehensive, and embraces all foul, filthy, organic matter passing through its decomposition, whether terrene, miasm, malaria, or what not. *Every thing terrene* that is injurious to health may be so denominated. I wish to be distinctly understood here, that neither meteorological nor terrene causes alone, is sufficient to produce the effects alluded to, and hence the great difficulty and stumbling block, when one of these is

The other blade of the "shears."

found present, even in an aggravated degree, and not the other, and the effects do not ensue.*

Epidemic yellow fever then depends upon two circumstances: first, a *meteorological*, and secondly a *terrene cause.* The *precise amount*, or constituents, of which each of these consists in their original or proximate elements, the present state of science has not yet informed us of. Of the first, I have shown the main ingredients; of the second, it is probably composed of all decomposed or decomposable matter. The varieties of fever, most probably, depend upon variable amounts of these constituents, influenced by the physiological condition of the individual, which only slightly varies the extreme force of the causes producing an epidemic. I have expressed the opinion that an *epidemic* yellow fever proceeds from a *general* distemperature of the air with local influences, and particularly with an undue disturbance of the original soil. I shall show presently that an *endemic* yellow fever depends upon a more local distemperature, with the same local influences, but in a minor degree, and that the type or malignancy depends upon the more or less extent of these causes, and finally, that *bilious or periodic fevers* depend for their existence upon the *same causes*, but in a *much* diminished degree.

From whence varieties of fever.

In examining into the cause or origin of our epidemic yellow fevers, there is no reason why we should not apply the same principles, as in initiating the cause or origin of other fevers, or other diseases. If we cannot say that we have the very precise and exact meteorological data, or the precise amount of decomposable matter, we are just as near the *truth as we are in looking into the causation of any other disease.* Overpowered by the magnitude of the disease, and bending before the authority of great names, we suffer ourselves to be blinded to the plainest facts. It is considered by some, as an act of temerity or folly, to dare to think of preventing it; that

To apply the same principles in examining into the causes of yellow fever as of other fevers.

*This, it seems to me, will explain most of the difficulties that have set them by the ears in Charleston, in relation to the occurrencces of last year, and why they *did not have the fever there,* "the *meteorological* cause" was said to be present, the other was not: the "Jacksonism" of the Mayor did not consist "in removing the two cases" that occurred, but in his praiseworthy energy in keeping the city *thoroughly clean*, in preventing the concurrence of the second, and equally essential cause, (now, the causa sine qua non.) It is a great pity some more Southern cities had not been blessed with a little of that wholesome "Jackson" energy, and common sense of duty, instead of being contented in boasting of the existence of "cleanliness" and "health!"

such ordinary things as heat, moisture, filth, and such like trifles, however combined, could give rise to this great monarch of disease, (y. f.) is but playing with human credulity! They forget, all the while, that a sudden change of temperature alone, has often deprived human beings of life, in a few hours; that vitiated air has, still oftener, killed in much less time, and that nearly all disease to which man is subject, is caused by conditions not widely different, or so minute as to defy the utmost power of detection. It is time to put aside and be done with all this stultifying and misleading mystery and awe, and boldly facing, and defying, all carping misgivings, push our scrutinies as far into the causes as our facts and reasonings will legitimately carry us.

1st proposition. Cause of every epidemic.

Proposition 1st; now, if we can prove that the EPIDEMIC YELLOW FEVER has *never occurred here* but in a *certain condition of things* in so long a period as sixty years, that *it has always occurred* here *when this condition was present*, and that it *has occurred* in at least three other places under similar conditions, so far as can be ascertained, of between twenty and thirty years each—then there is a *fair presumption*, if *not more* that *we have arrived at one source of its causation.*

2d do. Cause of our endemics.

Proposition 2d; if we can prove that our ordinary ENDEMIC *yellow fever*, occurs here and elsewhere, under certain contingencies of a high temperature, for a certain time, with a combination of much moisture and filth, that *these are never known to be absent when it does occur*, that it has occurred under circumstances, where no foreign origin could *possibly* be imputed to it, that if there should be apparent exceptions, viz: that it does not always occur where these are *all apparently present*, is it not fair to presume this to happen, rather from some defect in our observations, (and we well know how imperfectly and under what prejudices and defective knowledge these are often made) than from any deficiency in the constituents themselves, or than an occult cause? Can we not then, with all reasonable presumption infer, that the above are really the causes of yellow fever? If we prove that when these are removed, that it does not occur, is there not another proof of the sufficiency of the cause, especially for all practical purposes? And is it not at war with one of the first rules of philosophising to hunt up extraneous causes, to account for that of whose origin we *have sufficient* proof? and the 3d proposition is, that these causes existing in a less degree, will *produce bilious and periodic fevers.*

3d do.
Cause of our bilious fevers.

With regard to the first proposition, I wish to be understood distinctly as stating, that *since* 1796–'7 *to the present time there has been no great epidemic yellow fever in this city, without an extensive breaking up—disturbance and exposure of the original soil of the country;* that this has consisted in digging canals and basins or cleaning them out, either in the city or its immediate neighborhood, digging and excavating the streets of the city for the purpose of laying down gas and water pipes, and relaying the streets—digging and embanking for railroads and similar purposes, in the summer season, and relyingly—refer to the Chart A, for full and conclusive proof thereof; and that the *extent and malignancy of the disease, has been pretty much in proportion to the extent of these exposures.*

Of the first proposition.
Proof.

The first epidemic yellow fever that is recorded here, is that simultaneous with excavating the earth, in digging the Canal Carondelet, and more especially its basin in 1797. I am informed by a highly intelligent and observing creole gentleman, that the fevers during the period of digging this canal were awful in its neighborhood, even with Creoles;—and that last year the sickness in the vicinity of the excavation of its new basin was very extensive, although there were few but natives and acclimated exposed to it.

Succinct origin of all our epidemics.
Of 1797.

The next most extensive yellow fever epidemic occurred during the cleaning out the same canal in 1811. Then we have the next severe epidemics of 1817–'19–'22, simultaneous with extensive exposures in the streets for pavements—large fillings up and enclosures of the batture, and the cleaning out and deepening the same canal.

1811.
1817.
1819.
1822.

Then follows the great mortality of the epidemics of 1832–'3, the largest we have ever had in this country, resulting from the immense exposures of the swampy soil in digging the Bank Canal from the city to the lake. Then follows the epidemic fever of 1837, resulting from digging the extensive trenches and canals, to drain the rear of the First and Second Districts

1832–'33.
and 1837.

CHART EXHIBITING THE ANNUAL MORTALITY OF NEW ORLEANS,

per 1000 of its Population for each Year; together with the causes influencing or producing it, from 1787 (with a few exceptions) to 1854.

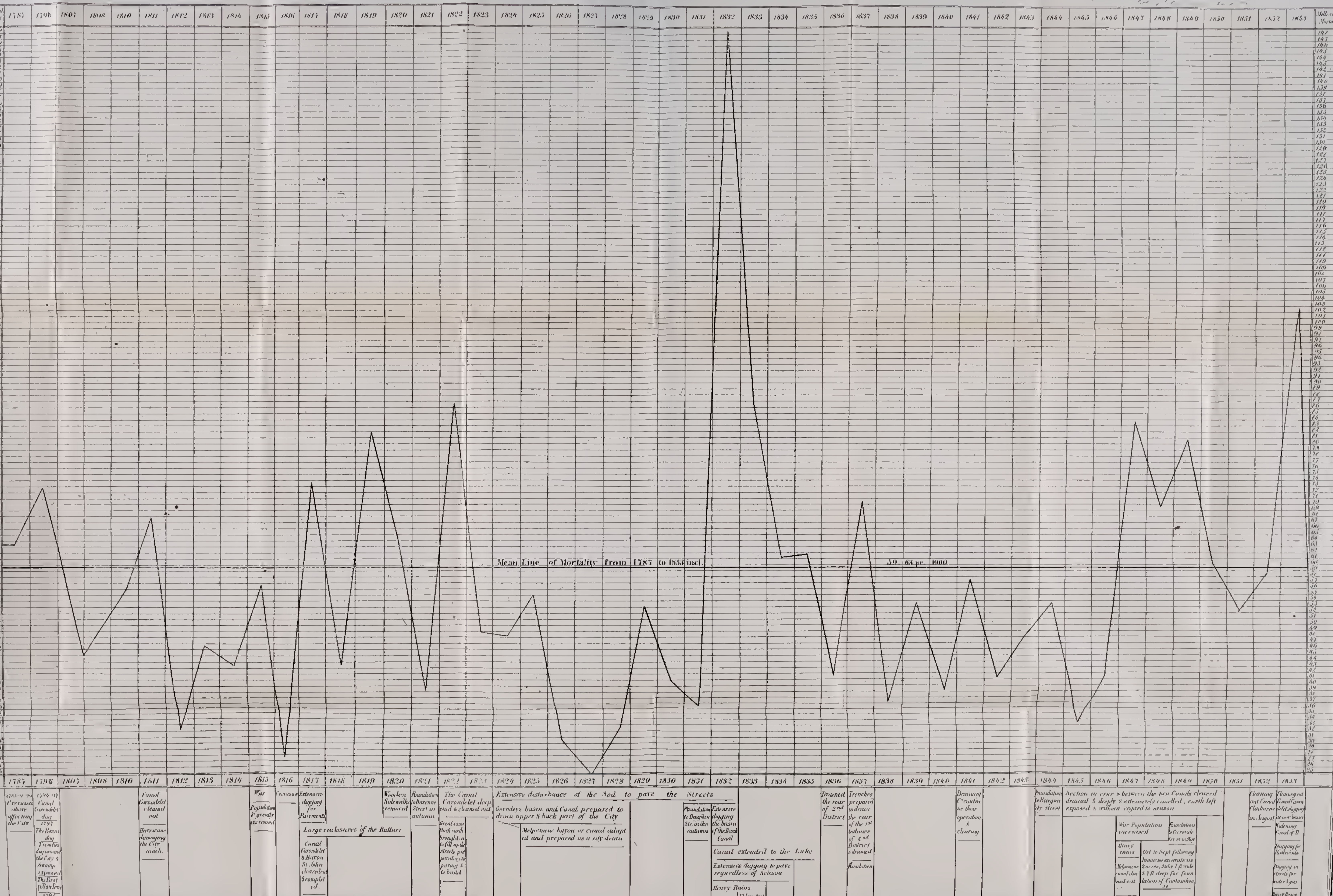
Illustrating the Report on the Sanitary Condition of New Orleans

by **E. H. BARTON, A.M., M.D.**

Year	Population	Total Mortality	Ratio pr 1000 of Population or Millesimal Mortality
1787	5,284	338	63.92
1796	8,756	638	72.86
1807	17,001	773	45.23
1808	July to July 17,081		
1810	17,242	963	55.85
1811	18,233	1,239	67.94
1812	19,229	624	32.24
1813	20,222	939	46.44
1814	21,216	926	43.64
1815	22,209	1,272	56.37
1816	23,303	651	27.80
1817	24,196	1,772	73.22
1818	25,190	1,106	43.90
1819	26,183	2,138	81.65
1820	27,176	1,766	64.98
1821	29,441	1,165	39.29
1822	31,706	2,734	86.86
1823	33,971	1,662	48.92
1824	36,236	1,748	48.23
1825	38,501	2,177	54.98
1826	40,766	1,248	30.61
1827	43,031	1,057	24.56
1828	45,296	1,490	32.89
1829	47,561	2,520	52.98
1830	49,826	2,022	40.58
1831	52,455	1,926	36.11
1832	55,084	8,099	147.02
1833	57,713	4,976	86.21
1834	60,362	3,687	61.10
1835	62,971	3,875	61.53
1836	65,600	2,734	41.66
1837	68,229	4,807	70.45
1838	70,858	2,606	36.77
1839	73,487	3,936	53.53
1840	76,116	2,077	30.11
1841	78,745	4,549	57.16
1842	81,374	3,375	41.47
1843	84,003	4,050	48.21
1844	86,632	4,620	53.32
1845	89,261	2,983	33.41
1846 (Including Lafayette)	102,030	4,220	41.34
1847	108,600	9,043	83.11
1848	115,503	8,026	69.48
1849	122,511	9,862	80.49
1850	129,747	7,810	60.26
1851	138,599	7,275	52.48
1852	147,441	8,670	58.80
1853	154,132	15,787	102.42

EXPLANATION.

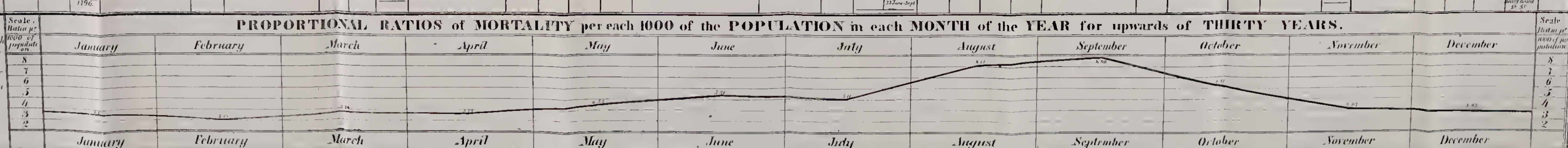
The elevations in the perpendicular columns for each year, indicate the Amount of Mortality as shown by the Scales on the right and left, on a level with the horizontal lines.



EXPLANATION.

The elevations here under each month indicate upon an average of a long series of years, the Monthly Mortality, and of course, the monthly liability during the year

PROPORTIONAL RATIOS of MORTALITY per each 1000 of the POPULATION in each MONTH of the YEAR for upwards of THIRTY YEARS.



The next largst mortality, and which has continued ever since, arose from the large *new canals and clearing* and exposure of the soil, between the two Canals, in rear of these districts, without regard to season, and the immense excavation of two acres of ground and with the removal of upwards of 336,000 cubic feet of earth for the foundation of the new Custom-House, in the heart of the city—beginning the latter part of October, 1848, and ending in the succeeding August, *during which period* we had a severe epidemic of cholera with a mortality of upwards of 3,600, and during the balance of the year of 243—with a loss by yellow fever of 769. During the succeeding year (1850,) the mortality from cholera was 1,448, and in '51 of 645, and in '52 of 1,326, with the addition of 597 deaths from yellow fever during these three years, for effect of all which refer to chart A.

1846-'48.

1848-'49 &c., and its consequences.

And, finally, which has contributed so much to produce the great calamity of last year (and on which mainly I founded my prediction of the fever in the preceding May)* was the extensive exposures of the earth in making a new basiu for the same canal (Carondelet)—clearing out the canal—dredging the Bank Canal—extensive exposures of the earth in deepening the ditches between Conti and Common streets, and also in the rear of the third district, the digging and exposure for the erection of a levee between the two canals on Lake Pontchartrain—the large excavations on miles of streets in the centre and front of the city—for laying down gas and water pipes and making and relaying pavements—as exhibited in black lines on the Sanitary map—the extensive exposures for laying the foundation of

The special causes for the epidemic of 1853.

* See published "transactions" (of that date. page 10) "of the New Orleans Academy of Sciences," for the details of this prediction

Is it any more unreasonable for us to predict the occurrence of disease, occurring under precedent well known conditions, than that nearly all inferior creation should have the power of foretelling future events that are essential to their safety The *instincts* of the spider—the tree frog—birds so announce to them, hours and days beforehand, a coming change in weather; the Beaver—the Bee, &c, have the power of foreseeing *months* beforehand, floods, droughts or other inclemencies of the weather, that would otherwise be absolutely fatal to their existence. Surely, this can only be derived through meteorology proceeding from a sensitiveness or means. far beyond what we at present possess If a greater difficulty is experienced with us, the cause may be found, besides in that of the imperfection of our meteorological instruments—that disease is the *result* of a *two-fold condition*—a meteorological, and local or personal one, and that, as yet, observation of the influence of this combination on the human body is too limited for general knowledge With more industry in collecting and recording facts, the time may not be distant when success shall more frequently crown our efforts.

new buildings (especially on Front street,) and the excavations and exposures for railroad purposes in the rear of the first and fourth districts and at Algiers. Here then we have a combination of materials of exposure of the original soil unprecedented in our annals, probably excepting that of 1832,* which was more concentrated, and the *consequences* have been correspondently destructive, in combination with meteorological conditions (before expressed) in proof of which this mortality *continued large as long as this exposure continued*, no doubt influencing the two epidemics of 1833, of cholera and yellow fever, and causing the large mortality of the two succeeding years (see Chart A,) and *every large mortality since.*

Cholera and yellow fever highest grades of zymotic diseases.

Exposure of earth with heat and moisture worst combination.

The first proposition then, is believed to be fully sustained. Looking upon the epidemics of cholera and yellow fever as the highest of the zymotic class, (of what is called malarial disease,) requiring for their existence a great accumulation and concentration of their respective causes; the one being a disease of the cool, and the other of the hot months; and believing that an extensive exposure of fresh earth, when conjoined with filth, crowding, &c., with the meteorological causes which in the union of high temperature and great humidity have been always present, form the worst combination, the occurrence of these diseases during the period referred to are fully accounted for, and amply affirm the correctness of our first proposition.

How they were first made known.

No effect without an adequate cause.

These curious and remarkable developments occurred to me in the course of my statistical investigations and scrutinies into the *causes* of the mortality of this city, in which I have felt a deep interest for very many years. After constructing the upper part of chart A, the immense discrepancy in the mortality of the several years immediately attracted my attention, and as there could be no effect in the physical world, without an adequate corresponding cause, and as it so much exceeded that of the rural districts around us, all the changes in the physical condition of the city and neighborhood were carefully investigated and placed to their proper date, under the mortality of

* The greatest mortality was by *Asiatic cholera* that year.

each year respectively. The subject became interesting as I proceeded; its valuable bearing soon became apparent; a clue was evidently found to the causes of our fatal epidemics; and finally, it was clearly demonstrated by the facts collected and exhibited on the chart—in the language of the proposition—that "there has been no great epidemic yellow fever in this city, without an extensive disturbance of the original soil of the country," and this, I think, has been fully proved, There is no other to which to attribute it; no other great change either *in* the earth or *above* the earth, so far as my meteorological observations have extended, (and my investigations in this line have reached as far back as any records could possibly be procured,) and for many years back they have been made by me with great care and minuteness, in order to throw some light on this curious and important, and to us, vital subject. It has been too constant and invariable for a mere coincidence, and can be viewed by the philosophic mind in no other way than as cause and effect.*

Too invariable for a mere coincidence.

More fully to satisfy my mind in relation to the important bearings of this subject, more especially, since the appointment of the Sanitary Commission, to investigate the origin of our late great epidemic, I determined to extend my inquiries to other places, and see if similar facts and analogous results were recorded elsewhere. Accordingly, the corroboration has been most remarkable. leaving not a remnant of doubt on the mind, as to the fact or the consequence.

Prof. Merrill, (formerly of Natchez, and now of Memphis,) has clearly traced the successive epidemic yellow fevers that have

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* It is due to myself to say that there may be various errors in the materials of which this Chart has been constructed, in a country where there are scarcely any records (official) of anything relating to the vital statistics of the country (of births, deaths and marriages) The data are to be obtained at great cost of time and trouble, from sparse and occasional sources. The materials to construct this Chart have expended much of these before even their chief value was apparent, by applying them to each other They will, I trust, serve the basis of an instructive future, if we are to be instructed by any lesson derived from the past. I have taken great pains to make them as correct as my materials would allow, and do not think it contains material errors It would seem as if our object was to avoid records, to destroy the frightful facts they expose It is very true we *should be ashamed of them*, but then the humane and honest way would be to *correct* not *conceal* the truth. About four, times have we had short-lived "Boards of Health," (that is, Boards of *Record*—for they have had little other power) since 1841, and so far as their records have been published, so well: otherwise, it is *nobody's business to take care of valuable city records!* and this report has thus been much detained from the public from that cause.

in a series of years devastated Natchez, to the cutting-down, leveling and filling up the streets. "This city," says he, "is built upon a bluff; in 1816, the city authorities began to put into operation a plan for reducing the irregular superficies to what was considered a more suitable grade. During all that year a large amount of work was done, digging down and filling up streets and lots, without due regard to the maintenance of a proper drainage. The succeeding autumn the *first epidemic yellow fever* occurred, and produced a frightful amount of mortality. As soon as the shock of the epidemic had partially subsided the work of grading was resumed. No one could perceive why it should be considered the cause of the disease, and the work went on, with a recurrence of the epidemic visitation every second year, until, the population having been several times decimated by death, and business and property greatly declined, the city found itself scarcely able to continue the improvements, and scarcely worth them if made. After the dreadful visitation in 1823, the work gradually declined, and the subsequent return of the disease declined in violence and fatality *pari passu*, until the last of the series, in 1829."

Proofs of the cause of each of the epidemics at Natchez.

"Soon afterwards a new era commenced. Exuberant prosperity overspread the land. A new population was brought into the city, and in 1834–'5–'6 the grading was resumed to some extent. The doctrine of domestic origin and artificial causes had again lost ground. The voice of experience was not heard or overruled, and the penalty again suffered. Many of the older inhabitants foresaw the result in fear and trembling, and the epidemics of 1837 and '9 sent many to their untimely graves. The eyes of the living were again opened to see their danger, and its causes, and since that time little grading has been done."

"Now that these experiments did render Natchez sickly, there can be no reason to doubt. The coincidences were too striking to be viewed as accidental. Besides, the same effects following the same causes, have been observed elsewhere. Private residences and plantation negro quarters have suffered in the same way; also workmen on railroads and canals—upon levees and upon city wharves and landings, as well as persons residing in the neighborhood of such works."

And again, notwithstanding previous warnings—in 1853, at Natchez, the levelling the streets by the cutting down the adjoining banks, and superposing the fresh earth on the streets resulted in the fever. It is said to have first broken out in the immediate neighborhood where this took place—that here occurred its largest mortality, and thence it spread to the neighborhood.

The same gentleman has most satisfactorily ascribed the insalubrity of MEMPHIS, to the same cause, and the same effects have followed similar causes in the rural and otherwise healthy districts, on the blacks as well as on the whites. **Do. of Memphis.**

The severe epidemic yellow fevers at *St. Francisville*, in 1827 and 1829, were to be clearly debited to the cutting down the hills, spreading the materials on the streets and grading them, digging cellars, &c., during the summers of those years, (from personal recollection) and the epidemic of 1839, at *Bayou Sara*, was equally due to the filling up, by spreading fresh earth over brushwood, and filling up low places.* And for the *only other epidemic* known to have occurred there, since its settlement, that of 1853, may with much propriety be ascribed to parts of a levee made and ditches dug—acres of saw-dust from a saw mill spread and low places filled with it, and for years previous, working extensively on the streets just previous to the epidemic, and extensive swamp leveed off and dried up in the vicinity.† **Do. at St. Francisville and Bayou Sara.**

At *Lake Providence*, the decay from the extensive spreading of saw-dust over the streets and filling of lots, producing a very offensive odor; unusually low water; extensive exposure of river bank.‡ **Do. at Lake Providence.**

At *Fort Adams*, extensive exposures of the earth from large cavings in of the river bank.‖ **Fort Adams.**

At *Centreville*, extensive ditching and stirring up of mud in the principal streets or roads of the village—"past summer unusually wet, and heat of the sun very great."§ **Centreville.**

* As stated to me by my friend Dr. J. W. Bell. † Dr Brown. ‡ Judge Selby
‖ Dr. Benedict. § Dr. Wood.

Clinton. At *Clinton*, working the streets, and unusual disturbances of the soil and of back yards during August and September, and to the middle of October.*

Trenton. At *Trenton*, on the Ouachita, soil greatly disturbed by the "*improvement*" of the streets; soil brought from a distance and spread on the main street; several excavations made for new cisterns in May and June; marshes and pools near the town.†

On the La Fourche. Dr. Kitridge informed us that the fever on his own place—in the interior, *on Lafourche*, arose, most palpably, from spreading over his large yard, fresh earth from his neighborhood, not a case of the fever then existing within fifty miles of him.

Natchitoches. At *Natchitoches*, ditches of the town cleaned out in August, and a great deal of disturbance of soil, to lay down pavements in July and August.‡

Algiers. In *Algiers*, on the opposite side of the river, during the last season, extensive embankments of earth and excavations were made for the Opelousas Railroad, the fever broke out and devastated that village; of 350 hands employed on the road, 300 fell victims to it.

On the Jackson street railroad extending from this city, I am informed fifty hands out of eighty died of it.

Of the amount of mortality on *the Great Northern Railroad* I am not so well informed—their sick being brought into the city when attacked. But the tracing the fever along the lines of these roads will be found in a subsequent part of this Report.‖

So far for its influence in this state, let us extend our inquiries to the neighboring State of Alabama.

Do. at Mobile. Dr. Levert of *Mobile*, has most satisfactorily traced *every epidemic yellow fever*, that *has afflicted our sister city* for *upwards of twenty-eight years*, to *similar disturbances of the soil.* So convinced had the authorities become of its injurious influence, that a city ordinance had been passed, forbidding it during the summer, which was most unfortunately rescinded last spring, and the disturbance had again taken place to a greater extent

* F. B. Harvey. † See testimony. ‡ Dr. Crocheron. ‖ Same informed 50 per cent. of the hands died.

than ever—to accommodate the railroad, and to fill up some low lots, and the consequence have been chronicled in a corresponding calamity. I refer, with great pleasure to his valuable report among our proceedings.

At *Selma*, the occurrence of the epidemic of last season, has been most satisfactorily accounted for, in a similar manner. At Selma. "To the removal of old deposits, exhumations, the filling up of a hollow, various deep and extensive excavations for the foundation of buildings, the filling up and grading streets with it, and vacant lots. The first twenty cases of the epidemic occurred within the limits where the earth was deposited and seemed to radiate from these deposits. Digging commenced about the middle of July and continued to November—season very wet and particularly in August. Fever broke out in September.*

At Montgomery there had been considerable excavations for the purpose of laying down gas pipes, and the earth thrown up Montgomery. was stated by my informant to have been very offensive.

At Hollywood, on Mobile Bay, an unequivocal case of the spontaneous occurrence of the disease is mentioned by Dr. Benedict, arising most probably (in a boy) when the sole cause to Hollywood. which it could be ascribed, was his being exposed to the fresh earth from digging a well.† Precisely the same thing has happened in *Algeria*, and mentioned by the French surgeons, engaged in the same business, those employed in it alone suffering while all the others escaped.

At *Gainesville*, much disturbance of the soil from digging Gainesville. and "improving" roads, ditching. &c. Well dug—on cleaning it out it consisted of a sticky and stinking deposit.‡

In Charleston these disturbances are forbidden by ordinance during the summer season, from their experience of their disastrous effects on the public health. Dr. Simons, who has been In Charleston. for some thirty years their chief Health Officer, specifies in his late valuable report on yellow fever there, that "in 1842, white laborers strongly predisposed to yellow fever were employed in

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* See the interesting report of Dr. Mabray, among our proceedings. † See his interesting paper in our proceedings. ‡ Mr. Fulsom.

opening drains and other works, and transferring the earth to different portions of the city, where drains were opened and the earth deposited—there yellow fever occurred, and the unfortunate beings who performed that work were the greatest victims. The same thing occurred in 1852. At the new custom-house a number of Irishmen were employed in excavating the earth and piling; a great many were taken sick and died; the sale and distribution of the earth through the city had a baneful effect." Other instances are mentioned of the dangerous influence of excavating and exposing offensive materials in opening drains and transferring the materials to other localities, even producing sickness in a class of persons who are usually exempt.

Value of a sanitary survey.

These are some of the valuable results of the investigations of the Sanitary Commission. They would have been doubtless, greatly multiplied had it been in their power to visit personally (as was their desire) every district in the six States where this epidemic extended. There is no substitute for effective personal examination on the spot, and the public interests would be greatly advanced by a minute sanitary survey by competent men over the entire region. No geological survey has a tithe of the claims on the public interest, for salubrity is the *first* object for accomplishment for the public welfare. Public wealth is often developed by the first; the sanitary condition is much more often advanced by the other. An ignorance of the causes influencing the salubrity of cities, towns and rural districts often subjects them to the most afflictive calamities, entirely within control. This has already been made apparent by what we have already said, and will be made much more so as we proceed.

At the Chesapeake and Potomac canals.

By extending our examination into other climates we find the same injurious results have followed the upturning the earth for digging canals, opening roads, the establishment of brick-yards, and cutting down of bluffs. The excavations for the Chesapeake and Delaware Canal were very fatal to its laborers and the neighborhood, costing hundreds of lives; and so was that for the Potomac Canal, above Georgetown, a very large mortality having resulted from the excavations. The writings of Drs. Drake, Evans, Blane, Cassan, McCulloch, Caldwell, Bailey, Thomas, and many others, are replete with instances in proof and illustration, and the whole body of physicians attached to the French army in Africa have given their opinion of its injurious influence in the production of fever. And other countries. In Africa.

In *Martinique*, West Indies, "extensive disturbances of the soil, in the alteration and construction of roads in different parts of the island, causing great evolvement of miasm, causing the fever."* At Martinique.

At *Fort de France*, (Martinique,) "public opinion regarded the fever as due to the *cleaning out a canal* which surrounded the city."† Ft. de France.

The first disturbance of the original soil of a country for agricultural purposes (or the time during which it is passing through what I have elsewhere denominated the "transition period") is known to be highly injurious to health everywhere; and the devastations on the early settlers in all our newly opened districts of country are too well known but to be merely referred to in illustration, developing wherever they have occurred the worst forms of the diseases of those climates respectively. In a few years these subside, the insalubrity following the hardy pioneer along the outposts of population, to the margin of the wilderness, to each newly opened district, and then passing off like a morning cloud before the rising sun. Same results on first cultivating a country.

The special injury in a Southern country by *unskillful* clearing and exposure of the original soil, without protecting the homestead, has subjected this and the adjoining States, at their early settlements, to calamitous devastations from the most aggravated forms of endemic fevers—consisting of algid fevers, (called "cold plague" from the coldness and blueness of the surface,) sometimes running through its course in a few hours, and to which I never thought I could discover any acclimation--and it is only since the *status* of the Disturbing original soil canse of our epidemic.

* Dr. Amic. † Dr. Amic.

country (in these respects, clearing and exposure) has become fixed and unchangeable that Louisiana has ceased to be called the "grave-yard" of the Southwest.

Of the sufficiency of the cause to produce the epidemic here, I trust satisfactory reasons have been stated. Ordinary fevers of various grades and intensities of malignancy are produced every year by its greater or less prevalence; but the highest grade known to this hemisphere, (yellow fever,) and of such malignancy as characterized it last year in an *epidemic* form, is alone produced by such an exaggerated condition as then prevailed in a concentrated state, and from the facts presented in Chart A, I think I am justified in coming to the conclusion which I have, most deliberately, after a full reflection upon all the facts presented: that the *emanations arising from the upturning and exposure of the original soil in the summer season, together with filth, under certain determinate atmospheric conditions, has been the main, if not the special cause of every epidemic yellow fever that has ravaged not only this city, but the Southwestern part of the United States for more than half a century!* It is no exception to these statements that digging for mines, and especially, in cooler and more healthy climates (or climates less subject to *fever*) does not have the effect above alledged. My *second condition* (*the meteorological*) is wanting; that it is not always innocuous is well known, (of which I have given some evidence, and could have furnished much more.) Every climate is more or less influenced by particular pathogenic entities, giving it a liability to the evolvement of special diseases. That this has been injurious over a wide extent of Southern country, especially, of the United States, the testimony clearly proves; that it may be expected to be more mischievous in a hot and moist climate, is probable enough.

The special cause of every epidemic yellow fever in the Southwest of the United States.

From the facts adduced and which are entirely reliable—skepticism itself may well be set at defiance. It has not been left to this late day to make these remarks for the first time, although they have not been probably as extensively generalized before, and acknowledgments and references have been made of it, in another page. This emanation from the earth may be the "*something divine*" of Hippocrates, it may be "*the something from the bowels of the earth*," that the great Sydenham nearer approached, to which modern science and observation has added, the atmospheric condition, to furnish it the necessary element of activity.

Testimony of Hippocrates and Sydenham

If I am accused of making a bold assertion, it is, by no means, a reckless one. The valuable records in the preceding pages and Chart, will fully sustain the position under the most scrutinizing investigation on the part of the city authorities, and with its *truth* and the precaution, it *necessarily teaches*—it must hereafter *much depend for its salubrity*, its exemption from the greatest scourge with which our fine country is so often inflcited, and its future prosperity and advancement so much retarded.

It is in vain to say that the facts which the Chart exhibits, are but *coincidences*, the records I have given from other places, the multiplied instances of personal experience, now that public attention has been called to it; amply attest its probability and establish its verity. Coincidence by itself, is of little account, it is constancy which gives it importance in the relation of cause and effect and establishes the law. Can that be called mistaking a sequence for an effect—a coincidence for a cause? Is it but a hasty generalization?—is it a *post hoc propter hoc* mode of reasoning to infer a law from a constant result, *in one case of near sixty years uniform sequence* (as in New Orleans)? *in three others*, (Mobile and Natchez and St. Francisville,) *of more than twenty-eight each*, and of a vast number of others that these pages exhibit, that an exception here would but prove the rule? And if proper records and observations had been made every where in the Southern country, who knows how immeasurably they may have been multiplied? It is consolatory then to know that sufficient facts have been collected to establish a principle,

Too many coincidences to be other than cause and effect.

Ample proof.

and that our generalization has not been hasty, and it is equally important to know that it is in our power to control them!*

2d. For its existence in an ENDEMIC FORM other causes are adequate. The proposition then is that it requires an extensive disturbance of the original soil, or vast accumulations of decomposable materials to produce an *epidemic,* presuming that the meteorological conditions are present (and heretofore there have been always causes to produce them, when we have no recorded proof of their being present.) Let us proceed a step further, and this embraces our second proposition, or the causes of our ENDEMIC fevers, the difference being only in the amount and extent of causation. The distinction then between the major and minor proposition (the first and second) is, as a *general* to a *local* one. The causes are the same, differing only in degree—they are essentially identical, varying only in extent of prevalence, and sometimes in malignancy, which, it is also fair to infer, proceeds from the greater or less intensity of the original cause. Of these, a certain amount of fresh earth exposure, with other concurring circumstances produces an epidemic yellow fever and a less (supposing this earth and all filth the same, which I believe they are in effect) an *endemic,* what proportion of influence do they bear to each other? That is, the difference between the two, is the amount required sufficiently to poison the atmosphere to produce either the one or the other? It thus becomes almost a matter of calculation as a question of probability, which like all similar questions, must be liable to fluctuation within the fixed limits of possible error.

Cause of ou endemics.

3d. And this brings us to our third proposition, of a lesser cause of the same materials producing our bilious and periodic fevers.

The cause of our bilious and periodic fevers.

The cause of *bilious and periodic* fevers, of all kinds, is so much a matter of common observation—is received with so much unanimity by the profession, that they need not be

*I did not desire to incumber the text more with the collection of facts upon this subject from our own State—proving the connexion of disturbance of the soil with the occurrence of yellow fever and cholera, or, it might have been greatly extended.

dwelt upon; I need only here enter my *caveat* in relation to the existence of any *specific* thing; as *necessary* to their production, (and called "*miasm*" par excellence)—but believe as I shall hereafter state more fully, that exhalations of all kinds, *whatever impairs the purity of the air, is the terrene agent,* if any is requisite, to unite with meteorological conditions and moral and physiological causes in the production of these fevers. The great error upon this subject, seems to me to consist, in supposing that *any one specific thing* is required, the effect, the disease, is one thing, but that, by no means implies that the causes producing it may not be manifold. Now it is perfectly clear to my mind, and I trust the facts and principles set forth will fully bear me out, that several conditions are pre-requisite for the effect.

Proof of yellow and periodic fevers convertible and the same.

The similarity of the influences, producing these various classes of fevers, is most manifestly shown by what occurs at the commencement and termination of these epidemics and endemics respectively—where the productive causes being much less in concentration, or weakened in intensity—bilious, yellow, and periodic fevers are *constantly observed running into each other, and blending their symptoms* in the same places, houses, and even individuals. A fever of a remittent or intermittent type occurs, and terminates in black vomit and the hæmorrhages. Another fever begins with yellow fever symptoms, with the eye, countenance, expression, to convince the even, inexperienced attendant, that it is yellow fever; in its progress it assumes the intermittent form, and so terminates. They are, then, clearly *convertible fevers,* dependent upon the more or less concentration of the same cause, and the susceptibility of the individual. They are constantly occurring here—even last year, bad as it was, the table F will show how common it was; baffling the most experienced to christen it. The distinction is a very important one, for it seems to settle the long disputed question of the identity of bilious and yellow fevers—that their differences *exist in degree only*—that the same may be between bilious, remitting, and intermittent fevers—a difference in intensity arising from a more or less aggravation of the cause. Here are steps from the one to the other, that are no less interesting than important—not in a merely speculative point of view, but in one of the greatest practical value to the community; for, if they are the same, differing only in degree, it settles finally, the great *question* also, of the *preventive power of sanitary measures against yellow fever.* Here we find no skeptic; no one doubts that of all the great zymotic or preventible class, fever is as much or *more under the control of these measures than any of them.*

Importance of this in a sanitary point of view.

The following remarks by Dr. Pennell, of Brazil, evidently a practitioner of acute observation, as he is known to be one of enlarged experience, are quite illustrative and confirmatory of the views taken above: "In the bilious remittent of Rio, says he, the mode of attack, the position of the pains, and the *state of the pulse and tongue are highly characteristic.* The prevailing epidemic preserved these features in a most singular manner, and with but little variation."

Identity of bilious and yellow fever.

"I believe the diseases are essentially the same. They begin in the same manner, they have the same diagnostic symptoms, and no one can distinguish between them, except by their severity; a difference which may arise from a more intense form of the disease, or from a superadded poison, as already mentioned. With the exception of black vomit, I have not in the prevailing epidemic, seen a single symptom which I have not also frequently witnessed in the common remittent of the country."

"In no other way than by supposing the disease of endemic origin, can it be explained how the natives and acclimated suffer so little. Yellow fever was never known in Brazil before, and was, therefore, equally new to them, and to those recently arrived. The former have, evidently, all their lives, or during the period of acclimation, been breathing a marshy, or any other endemic poison you please, in a diluted state, and consequently suffered less from a more intense dose. The poison had for years been incorporated

Proofs in Rio.

with their systems. This is most conclusively shown from the different influence of the disease, by the various mortality on the several classes of the population, [as exhibited in Section IV,] although it is acknowledged, at the same time, that almost the whole population was affected by it.

" In no other way, than by supposing it to be of endemic origin, can it be explained, how ships come into port direct from Europe, with this identical fever on board." Of endemic origin.

How eminently applicable these remarks are to us here, all unprejudiced observers well know.

My proposition, then, in relation to the causes of our *epidemic* fevers, has, I trust, been fully sustained and corroborated by what has been shown to have occurred elsewhere (my other propositions have been equally satisfactorily proved.) If it will not equally apply to all the places where the yellow fever has appeared, it may be that there has not been *sufficiently concurring circumstances* of a congenerous nature, with the *meteorological condition*, which the Sanitary Commission has not been able to verify (from causes before stated). Again, it may explain the well understood fact, that many cases of the disease have been carried to certain villages and country seats, and have terminated with the individual, as in ordinary years, not spreading to the family or visitors. These appear to me satisfactory explanations of what has been a stumbling block, not with the public only, but with many of the profession. Why yellow fever not always break out with the apparent presence of the causes.

From the foregoing facts and observations, it is palpable enough that *two conditions* are required for the existence of an epidemic fever, viz: an atmospheric and a terrene or local cause. The proofs of it are so abundant that whenever they are omitted, it may be safely ascribed to *the fault of the observer*. In all, and everywhere, the influence of atmospheric conditions are found paramount and indispensable to the disease, and *equally so* is what is denominated " the focus of infection,"—that is, the presence of some localising filth, exposure of soil, &c. (all equivalent conditions). These are Two conditions necessary for an epidemic fever.

universal—there is believed to exist no exceptions to it. The occurrence of one of the conditions is not sufficient. Many proofs and illustrations of this have been mentioned in Section V, and they could have been greatly multiplied, not only this year, but every year of the existence of yellow fever either here or in foreign countries.

The presence of an acclimated population prevents effects proportionally to the cause.

That yellow fever should not occur at once upon all exposed, and in a fair proportion to their amount, is also satisfactorily explained, I think, by the fact, that a large portion of our population is acclimated to the disease, and is no longer susceptible. Nor do I suppose it necessary to say, in order to convince the public of the reality of the causes and effects, which I alledge, that our climate is peculiar; for there is a second condition, equally essential to the production of the effect, which may not exist in other climates, although usually present here, viz: heat and moisture. I am fully sensible that different climates have different diseases, and that the peculiarities that produce the manifestation of one kind of disease in one climate is wanting in another. The facts and principles, *as applicable here,* have, I trust, been satisfactorily demonstrated.

All climates have different diseases.

Although I look upon yellow fever as a specific disease, to which the subject is rarely liable but once; I am equally confident, that it is the result of the aggregation of circumstances and conditions, a less amount of which produces the ordinary fevers of the locality. This result I come to, after a pretty thorough personal examination of the facts, in many of those climates where this disease has been worst. I do not think this unreasonable, for we are not without analogies in other diseases, even where they are specific. Consumption is due to an impoverished diet, and bad physical and moral conditions in an unfavorable temperature, and it is eminently illustrated in Cuba, *where more of it exists* (*and particularly in Havana,*) *than in any part of America.* Measles, scarlatina, small-pox, have often arisen under certain atmospheric conditions, (warm, moist, and variable—*out of season,*) where they have defied the utmost scrutiny to detect a personal cause, and may have arisen from some of those combinations which originally gave them birth, and that in other circumstances, with the addition of the important elements of heat and moisture, give origin to fever. Can any one inform us why *small pox* should have had its birth about the period and place of the imposture of Mahomet? *Scarlatina* and *measles* also derive their parentage from the East, and are of comparatively modern origin. *All diseases have had their time and place of commencement.* Mr. Meriam informs us that cholera and small pox at St. Iago de Cuba, immediately followed the fearful earthquake that nearly destroyed that city, on the 20th August, 1852. Some diseases have disappeared—may be, never to return—but who can predict it, and upon what grounds? Some appear at intervals of fifteen or seventeen years, as the eruptive fevers, cholera, &c.; others at periods varying from fifty to one hundred years, and attack only one particular race. The Mexican *matzahuatl*, attacking only the *aborigines* of that country, notwithstanding other races were similarly exposed to it—about once in a century. The "sweating sickness" attacked only the English, wherever they were found, whether in England or in the heart of Europe! Most climates have their special diseases or forms of morbid action. Need I mention goitre, cretinism, leprosy, elephantiasis, biri-biri? They, unquestionably arose *from some combination of physical elements*, that either do not exist in other regions, or that have become controlled by the mode of living, the refinements of civilization, the extension of the comforts of life to the lower class, and the application of sanitary laws to all the purposes of living. I see, then, no reason why we should not be satisfied with the causes enumerated, as sufficient for the production of yellow fever, and particularly as their removal prevents or expels it. Indeed, it is not affirming too much to say, that we *actually know more of the causes of yellow fever than we do of those of any known disease, beyond the class "fevers," and as much as we do of any in it!*

Don't know the real cause of any disease.

How diseases have been changed.

The influence of climatic conditions and modes of life, in evolving peculiar forms of morbid action, is not only shown in those above mentioned, but is felt also in the great class of fevers—the typhus, of England, the great avenue to death there—is materially different from the fever of the African coast; and this differs from the yellow fever of the West Indies, which again differs from the *plague* of the East. The *parallelism of these*, as well as their points of divergence, becomes the more interesting and instructive, when we reflect that the countries are situated in similar parallels of latitude, that they have several points of geographical similitude, and there is the strongest grounds for believing that they are both entirely under the influence of sanitary measures. The *plague* occurs on the subsidence of the Nile; so does the *yellow fever* on the subsidence of the Mississippi. The plague localities are surrounded with ponds, stagnant canals, with decaying vegetable matter, exhaling their poisons to the atmosphere, accompanied with great *humidity.** Such is precisely paralleled here. The plague is sometimes marked by jaundice (or icterosed) and black vomit, and yellow fever sometimes has buboes and carbuncles—as was the case here last year. One attack usually exhausts the susceptibility to the recurrence of the disease, in many instances, much more certainly in yellow fever than in plague. At Constantinople, which is about the latitude of Boston, there is no acclimation against plague, any more than there is in Boston, New York or Philadelphia, against yellow fever. They are both diseases requiring a great concentration and aggravation of their producing causes, (as meteorological and terrene conditions) and hence both are diseases of cities, or wherever these causes exist in an eminent degree. Both have occurred in latitudes far North of their customary habitats and birth places under strong *temptation*. The latter, in England. formerly in latitude 52; in Moscow, in latitude 57, as late as 1771, '72, with a mortality exceeding our epidemic of 1853, by at least 500 per cent.—nearly half the population dying, and a similar mortality occurred in Marseilles in 1720. The former has pre-

Parallel of plague and yellow fever.

Similitudes.

Blach vomit.

Marshes.

Moisture.

Repetition of attack.

Latitudes.

* Prof. Gliddon.

vailed under similar circumstances, as far North as 42, and even beyond it; and in Cairo, from 10th February to 10th June, 1835, out of a population of 240,000, fifty-seven thousand died of plague, or $23\frac{3}{4}$ per cent.

There is another respect in which their similitude is almost equally exact: *neither are contagious.* In their endemic form, this is hardly disputed, but when the causes producing either, are sufficiently intense to produce an *epidemic;* then *within the epidemic* influence, they are both apparently so. For it has been clearly proved, by the long and intelligent experience of the renowned Clot Bey, (so long the distinguished Physician-in-Chief to Mahomet Ali, in Egypt,) that he had never known the plague to be communicated by contact, "when *removed from the regions of malaria, and all his attempts to communicate it had utterly failed.*" It is unquestionably just so with yellow fever. *The plague often occurs alternately at Cairo and Alexandria, with constant uninterrupted communication between them, without the suspicion of contagion*, or the slightest appliance of quarantine. The same occurs in New Orleans, in relation to her numerous sister cities which have constant communication with her. **Neither contagious.**

Attacks of plague most frequently take place at night, when the damp and heavy dews predispose to the disease. Such is often the case with yellow fever.*

Their points of disagreement are equally remarkable. In Egypt, the *plague* attacks most frequently the *natives*—those, in fact, who live in the greatest filth, and on the most meagre diet—and Europeans, and especially those from the North of Europe, with an appropriate personal hygiene, are rarely liable **Dissimilitudes.**

*RECOLLECTIONS OF J R. GLIDDON, ESQ.

1st. All the plagues remembered by me, (1818, '41) that is about five serious *epidemics*, began at Alexandria about November, *after the rains*, and in damp. cool weather—temperature, (thermometrically) unknown. It is also the season of the ebb of the Nile, and commencement of vegetation, (in Lower Egypt) as the slimy ooze emerges from the flood.

2d. All were temporarily weakened by the colder and drier weather of January, with its bracing N.N W. gales

3d. All arose to their intensest action *between* February and April

4th All vanished, as *epidemics* by 15th or 30th June

Hence, (ceteris paribus) the most deadly seasons of the plagues in Egypt, corresponded to a temperature and to an atmospherical condition—such as we had at New Orleans in February and March, 1852. [Very damp and oppressive.—E. H.B] to it, and thus are probably much more exempt from it than if similarly circumstanced in this region, they would be from yellow fever, although these are great protectives. In *yellow fever* these susceptibilities are reversed. The liabilities produced by temperature are very different also. Although each occurs sometime after the subsidence of the two great rivers of each country; the Mississippi begins to rise in January and February, and falls in June and July, and the yellow fever occurs in July and August, with our highest temperature. The Nile begins to rise in June, and about the 20th of August the whole valley of the river presents the appearance of a great inland sea. About the autumnal equinox, the waters begin to subside, and before the end of November the river is once more within its banks. The *plague* usually commences on or before March, and terminates towards the middl of June—the occurrence of the *inundation* puts an end to the plague—the yellow fever occurs on the *subsidence* of the Mississippi. "The experience of ages incontestably establishes that the plague *cannot exist* with a temperature above 80°, nor a little below 60°." With yellow fever it is different: a long continued temperature of about 80° *is required for its production*, and over 90°, unfavorable to its development. Nor does a lower temperature, at once, extinguish it—being usually a fever of a limited period (60 to 90 days*,—the *epidemic*, I mean,) when commencing late, it often continues after a frost, and even when the thermometer sinks below 32°, although not in the *epidemic* form—yet it usually subsides here with the occurrence of cool weather, and even when the *average* daily temperature is not below 70°, and at all points South of us it subsides when the thermometer is still at even higher grades. In other countries than Egypt, the plague has existed as a summer and autumnal disease—reaching its culminating point in August and September, as our yellow fever here. Of the extent that they are influenced by sanitary regulations, I have already spoken of the plague; I shall hereafter dwell extensively on that of yellow fever.

Acclimation.

Period of occurrence.

Temperature required for each.

* An average of about 60 days.

Egypt has no marshes (properly called), and except during the period of inundation, the climate is distinguished for its aridity. It is mainly on this account that it is famed for its remarkable influence in the cure of phthisis. Even as early as the time of the younger Pliny, he states in his letters that it was not uncommon to "send patients suffering from a tendency to consumption to the softer climate of Egypt."

Influence of its climate on consumption, and why.

Such are some of the more remarkable similitudes and diversities of these two great monarchs in Eastern and Western diseases, and fortunately, the valuable records of history bear us out in the statement that *both have yielded signal triumphs to sanitary measures.*

I have stated what have been the constituents of an epidemic atmosphere (meteorological and terrene) so far as the present state of science will enable us to give them, together with the important and interesting exhibit of Prof. Blodget. I do not deny that there may be others,—that must be left to future research to find out. Both have probably existed when the epidemic developed itself; when it has not, probably but one. The localising circumstance—disturbance of the soil, or filth of every kind, (which I presume to be of a congenerous nature,) has probably been wanting. Of the same character do I view half-dried swamps that have been recently overflowed. Now, it is well known, that for several years most extensive inundations have prevailed over a large portion of our State, and over the cultivated, as well as the uncultivated portions of it. That, as these have become partially desiccated they reach the conditions of all half-dried swamps, which are known to be highly injurious to health everywhere, and with the concurrence of the meteorological conditions, they have formed that combination of circumstances necessary for the existence and spread of a great epidemic.

Effect of our half dried swamps.

Know as we do of any disease.

These inundations are not only connected as one of the prominent causes of our great epidemic of 1853, but with

Inundations cause of increased sickness in this State.

the cholera and sickness of preceding years. This statement is not hazarded without extensive inquiry, and is in strict accordance with all medical experience, as recorded elsewhere. The lesson taught us is full of instruction, when it shows that not only the agricultural interest of the State is ruined by these repeated inundations, but, what is far more important, the salubrity of its population. It is demonstrated then, that the most active supervision upon the part of the State authorities is not only essential for its future prosperity—but for its existence.

Why the epidemic should commence in New Orleans.

That it should begin in New Orleans is not at all strange. It must *begin, or be developed somewhere*, and it is most within the bounds of probability that it should first arise there, where should exist the greatest concentration of these causes, and the largest number of unacclimated subjects, without the necessity of resorting to contagion, or even the extension of infection, to account for it. It must also be considered that the population of the rural districts, being always accustomed to breathe a purer air, are more susceptible of an epidemic influence when it has broken out.

Late inundations promoting the spread of the epidemic.

In corroboration of the position that the general extension of the epidemic is partly due to the late inundations, and in striking conformity to it, *those parts of the State which have suffered most from the epidemic have been the greatest sufferers*, so far as we can learn, by the inundations. I quote freely from the high authority of my friend, Dr. La Roche, of Philadelphia, (probably, the highest authority now living,) who has written extensively upon the subject.

"The examples of the injurious effects of draining and desiccation by artificial or natural means, and conversely, of the beneficial effects attending *complete* draining of marshy and insalubrious surfaces, or their complete submersion, are numerous and conclusive. They establish, beyond controversy, the fact that the insalubrity of marshy localities increases in compound ratio to the degree of desiccation they have attained. They show that the greatest insalubrity and mortality in such *local-*

ities always coincide with the period of greatest desiccation, *short of a complete dryness;* that this effect occurs earlier in hot, than latitudes where the drying process is slower; earlier when the season is precocious, and the reverse when it is tardy." Dangerous in proportion to desiccation short of complete dryness.

"The extensive prevalence of fever during hot weather, after the overflow of river, lake or pond banks, and at the receding of the water is well known to all medical readers, and has been noticed everywhere, and at all times." "The inundation occasioned by the overflowing of the Tiber, and the disease resulting therefrom, are referred to by Livy, Dionysius of Halicarnassus, Dio, Strabo, &c. Like effects were observed and noted in the twelfth and thirteenth centuries, under the pontifical reign of Innocent III, in the fourth, under that of Clement V, and are particularly described by Lancisci, who accurately pointed out some of the causes of the disease to which they gave rise. Inundations of the Tiber.

The city of Strasbourg, in France, is not often visited by malarial fevers. In 1824, the banks of the Rhine were overflowed, and remained for some time under water. Soon after the water had receded fever began to prevail, and continued to do so *during three consecutive years.* Nor did it cease before the soil became perfectly dry." "The occurrences recorded in Italy, Germany, Egypt, India, Senegal, Algeria, and many parts of our own country. The irrigations at Oran, Karguantil, Siliebel-Abbas, and other districts of Algeria, where the practice is extensively applied to agricultural purposes, and is carried to such an extent as to occasion a sort of daily inundation. Those of some of the departments of France, as well as those resorted to in the rice plantations of this country and Italy, have been found to give rise to the same morbific effects wherever and whenever the thermometrical condition of the atmosphere is such as to aid in the extrication of malarial effluvia. "Near the walls of a large city stood a very extensive and deep pond of water, which for forty years had served as a receptacle for all the filth from the houses and streets. As long as these putrid At Strasbourg. In France and Italy.

matters remained covered with water they were productive of no mischief; but when they had so far increased as to rise above the surface of the water, a most malignant fever spread through the tract of country adjoining the city."*

At Lyn Regis.

"Dr. Robert Hamilton, of Lyn Regis, in a pamphlet quoted by Bancroft, and referred to particularly in the London Medical Gazette, describes a remittent fever, produced in that place in 1779, by a freshet which occurred from the sea. The inundations from the sea are generally followed by severer consequences, in respect to health, than those from fresh water. If they extend far they cover much low ground under cultivation, and fill many ditches which, in many situations, cannot be drained by any other means than evaporation by the heat of the sun. The intermittent fevers which follow are of the worst kind, the effect being due to the dead fish that remain, and the effluvia from the destruction of reptiles, insects, &c., and vegetables which are destroyed by sea water. The gale of 1719 was attended by such an inundation, the effects of which developed by the heats of *five successive summers and autumns*, were seen in the fevers of those years, which were more violent, universally epidemic, and more fatal than Dr. Hamilton had seen them in the last forty years. These fevers have ceased to show themselves. The country around, which was once one of the most unhealthy, has become one of the most salubrious by the *complete draining* of the Bedford level."

At Bassara as an act of vengeance.

"When the Arabs, (as we learn from Mr. Ives), wish to take vengeance on the Turks of Bassara, they break down the dykes or banks of the river, and inundate the plains. On its evaporation the water leaves a marshy sediment which infects the atmosphere, and occasions fatal epidemics. During Mr. I.'s sojourn in that country the mortality from an occurrence of this kind amounted to no less than fourteen thousand. The same effects are produced at Bassara, and to a highly destructive degree after the ordinary overflowing of the Euphrates. Of the

In Egypt.

* Precisely the circumstances under which Gormley's Canal has become so injurious.

consequences arising from simple inundation, Egypt affords a similar example, inasmuch as its season of fever commences with the subsidence of the Nile. Every one must know that equally disastrous results have often attended the overflowing of the Danube, the Don, the Tigris. The yellow fever epidemic of Laguayra, in 1797, the first known to have occurred in that place, has been referred with much plausibility to the overflowing of the river of that name."*

At Laguayra; its first yellow fever.

The same results occur on the subsidence of the Nile. The exposure is direct and immediate to a burning sun as before mentioned.

The same effects occur here on the subsidence of the Mississippi, and its early or late subsidence materially influences the result; the period of decline is the period of fever. That the inundations of the banks do not usually produce their disastrous effects until the second year, is not difficult of explanation. The ordinary condition of our swamps (not marshes half-dried) is not injurious to health, as is well known throughout the State. When this is vastly increased by a crevasse, large additions are made to the swamp water. The cultivated country is inundated, and by the natural subsidence of the water is converted into a marsh, and has to undergo the successive poisonous stages of desiccation, with the evolution of results through solar influence, which takes a season or two, fully to develope. That the first year of inundation is not injurious, clearly results from the immediate removal of filth; that the second year the effects mentioned follow as results, is proved by the following authentic data, of its influence on this city, aided and aggravated by causes I have before dwelt upon. Of the direct influence in the country we have no sufficient evidence.

Inundations here do not produce disease first year.

Extensive crevasse, inundating large part of the city and neighborhood in.............................1816.
An extensive epidemic yellow fever in..................1817.
The hurricane inundating the city to Bourbon street, 1821.
Epidemic yellow fever in..............................1822.

Always the second year.

* La Roche.

The rear of the city inundated by a storm to Dauphine street in..............................1831.
The great epidemic of cholera and yellow fever in.......1832.
A severe blow drove the water of the Lake to Dauphine street in..............................1846.
An extensive epidemic occurred in...................1847.
Extensive inundation of the city to Carondelet st. in 1849.
About three thousand cases of yellow fever, and an increase of more than one per cent. in the general mortality of the city above the average in......1850.
There was a crevasse opposite the city in...........1852.
Large mortality of the epidemic in Algiers, which we have attributed to other causes, in..............1853.*

Different stages of draining produce different diseases

"The pond of Lindre Basse, in the department of the Meurthe, affords a curious illustration of the effects of the different conditions under which the malaria is generated, in modifying diseases arising from paludal infection. The first pond managed according to the triennial system common in Saloque, is two years under water, and one year dry. In the first year it is half filled, and gives rise to intermittent fevers; in the second year it is full, and typhus fevers prevail; in the third year, after being fished, it is left dry, and cultivated as a field, and in this year carbuncular affections appear. These diseases have succeded one another as regularly and invariably as the different states of the pond for a period of *sixteen years*, and the idea naturally suggests itself that diseases that have a common origin must have a more or less common nature, however much they may differ in outward appearance." These remarkable facts have been fully illustrated by what has occurred in the neighborhood of this city, and other parts of the State, during the last and preceding years.

Northwestern limits of the epidemic.

From the following extract of a letter to me from my old friend, Judge Bry, of Monroe, Washita, who, nearly at the age of eighty, still devotes himself, although almost blind, to the

* These inundulations doubtless aided the causes to which we have specially attributed the epidemics, and epidemics have occurred from the causes enumerated, without the inundations as in 1819, '29, '33, '37, '41, &c.

cause of science, the same views are put forth as the result of his long experience in this country; it also exhibits the Northwestern limits of this epidemic. "As a general observation on the river, (Washita,) I can venture to assert that except at Trenton, where the epidemic may have owed its existence to local causes, and Monroe, where it seems to have been brought from Trenton, the valley of the Washita was never healthier. From here to the mouth of the river, (170 miles,) there has not been a case to my knowledge, nor above, as high as the Hot Springs. I expected we should have had a sickly summer and fall, from an observation of fifty years standing, to wit: when the overflowed lands of Lafourche, East of the river, are covered by the general height of all streams connected with it, late in the spring, when vegetation is far advanced, high grass, shrubs in leaves, &c., the season after the secession of the waters will be unhealthy; that is to say, that the common autumnal intermittent fevers will prevail to a much greater extent than when the rising of the waters is earlier, and before vegetation is advanced. It would be worse than useless to mention to *you* my opinion as to the cause of that effect on the sanitary condition of that part of the Washita valley parallel to the overflow of the Lafourche."

Effect of the inundation late in the spring.

"I have also observed that principally, when the waters subside, the Eastern side of the river is healthier than the Western in many localities, of which Trenton is one. The receding waters have exposed to the sun, &c., large spaces or flats on the Eastern side. I have seen the vapor exhaling from these flats wafted as very thin fogs to the Westward at the rising of the sun, as if its rays drove them across, the air being perfectly calm. There have been what is called several cases of the epidemic, which readily yielded to good treatment and good nursing, but, in my ignorance, I believe that they were the common autumnal fever, assuming the type of the prevailing disease."

Effect of exposure after inundation.

Can it be any longer doubted, then, that the extensive inundations to which the State has been subjected for the preceding four years, has been one of the efficient agents in the production and spread of an epidemic unparalleled in our annals, and from a concurrence of the causes we have mentioned?

Observation and experience must precede science. *We* have had experience without observation, and if we will not be bettered by our own sufferings, may be, we will by that of others—let us then see what has been the farther result in those nations which have grown wiser and better by the combination.

At Demarara. "By draining and clearing at the British colony of Demarara, within 6° of the equator, success has followed in rendering the cultivated portion of the deepest and extensive morass, probably, in the world, a healthy, fertile, and beautiful settlement.

Near Philadelphia. "A large peninsular of land between the Delaware and Schuylkill, adjoining the city of Philadelphia, called the Neck, was formerly in its unreclaimed state, subject to the devastations of annual bilious diseases. Draining, banking, and cultivation have converted the marshes into fields and gardens, and the spot which once reeked with pestilence, now yields a rich harvest to the hand of industry, and promotes that health which it once destroyed. Another impressive instance of the effects of cultivation in reclaiming a swampy and sickly district to healthfulness and prosperity, is derived from the history of Near Calcutta. Calcutta, and the country around it. That city, built in a morass, on the banks of the Hoogly, was originally a speedy and almost certain grave to Europeans, who resorted to it for the purposes of commerce. But a well regulated police within, and the thorough cultivation of the environs without, have entirely altered its condition. The same is true of various other cities in the province of Bengal. The examples in illustration of our subject could be multiplied a hundred fold, were it necessary, to show that disease and mortality are receding before the efforts of industry, and life is prolonged by the enterprise of man. In some of the worst of marshy lands, where the thrifty Dutchman has robbed the sea of its domains, and which he only retains by his dykes, and by pumps worked by windmills, the effect of constant cultivation has powerfully counteracted those causes which at Walcheren, a few years back, nearly destroyed an English army. In Holland.

"The Pontine marshes were once the home of a thrifty, active, and healthy population. It then contained thirty-three towns—now nothing meets the eye of the traveler but here and there a solitary post-house, tenanted by wretched beings, rapidly sinking under the effects of various influences. It owed its former condition to its large population and constant tillage—to the extreme attention paid to draining the deposits of stagnant water, which accumulated upon it; to the acqueducts traversing it in all directions, affording pure and wholesome water; and to the protection afforded by groves. The present condition, is owing to the entire neglect of cultivation—the destruction of the acqueducts, pouring their contents over the campagna, giving rise to numerous stagnant lakes—the forests cut down—the whole region presents one wide scene of desolation and ruin. Near Rome.

"There are some precautions to be exercised, however, in these drainings, of which it is necessary to be apprised, for history is not without examples of its occasional lethiferous influence. First, then, partial drainings, or reclamations, are much more dangerous than the condition of undisturbed nature. Submerging swamps is probably less hazardous than partially draining them, for from the experiments of Williams, the evaporation from the surface of moist land, covered with trees and other vegetables, is *one-third greater* than from the surface of water, and it is a well established fact, that the *moister the earth*, the *more dew falls* upon it (under a similar exposure.) Experience has fully confirmed these views. The protection afforded by forest growth, acting as a screen, to impede the wafting of exhalations from recent clearings, has been often recorded in the history of medicine, and perhaps may be the reason why the ancients consecrated the woods in the vicinity of Rome to Neptune, in order to secure them from the

Precautions necessary.

More humidity than water.

Value of woods.

axe. To the final removal of these woods has, with some reason, been attributed an increase of danger to the unprotected city. Near St. Stephano, on Mount Argental, a convent is situated, which was famed for the salubrity of its air, but, since the forests which surrounded it have been cleared, it has become unhealthy. At Villitri, near the Pontine marshes, the cutting of an intermediate wood occasioned immediately, and for three successive years, fevers and other diseases, which committed great ravages. The same effect was discerned from a similar cause, near Campo Salino; and analogous examples might be adduced from Volney, Lancisci, Donas, and others. In our own case, a range of forest growth could be easily left to protect us from the additional emanations evolved, until *effectual reclamation* and *cultivation* shall have dissipated every possible danger.*

The baleful effects of our half dried swamps.

I should do great injustice to this part of my subject, were I to pass over the local influence derived from the conditions of *our half cleared and half drained swamps* in the rear of this city, on the epidemic of the *last season*—with their large, open, sluggish conduits, reeking with the most filthy materials it is possible to conceive—the refuse and drainage of a large portion of the city—of the half dried and pestiferous basin and canal of Gormley, with the offensive soap and tallow factories—vacheries, and dung heaps near it—in the immediate vicinity of which broke out some of the earliest and worst cases of the epidemic, and whose entire neighborhood, in proportion to the population, probably, occurred a larger mortality than any other section of the city. (See Sanitary Map.) And I now reiterate my firm and unalterable conviction, that it is utterly futile and deceiving the public and ourselves, to anticipate the enjoyment of health here, while the most thorough correction is not made in these and other hot-beds of pestilence. In fine, until the thorough drainage with covered canals—made in the cool sea-

* The above quotation is derived from an introductory lecture to my class when Professor of the Institutes and Practice of Medicine in the Medical College of Louisiana, in December, 1835, and *published then* Had the warning been taken and the advice heeded, the disastrous results of clearing and draining, *in the mode it was done*, would not have followed—in the *large increase* of our mortality ever since. But, we are in our infancy, and infants require many lessons. Is that of 1853 sufficient?

son—should have existed long enough (a year or two) for an undergrowth to cover the soil—now desiccated—then the clearing may take place, leaving rows of trees on avenues and streets, to absorb bad air, but not sufficient to prevent thorough ventilation. The imperfect manner in which this has been done, ever since 1846, and even before—about which time progress was made in the GREAT EXPOSURE IN THAT DISTRICT, is shown by the rapid manner in which the mortality has been gradually increasing—resulting in an average annual mortality (inclusive of last year) of 6.86 *per cent. to the entire city population.* This is shown on the Chart A, so as to defy all skepticism, and is derived from official documents.

Result of its improper exposure since 1846.

A remarkable instance, illustrative of these views, is furnished by what has occurred in British Guinea, during the last half century. The yellow fever has occurred there in determinate or oscillatory periods approximating to a metonic cycle (of about nineteen years). The only atmospheric element that has been specially referred to, to which adequate efficiency could be properly ascribed, was the agency of the wind (the heat and moisture there, is always abundantly great). The direct effect of these was to produce a most unusual elevation of equinoctial tides—even to the extent of thirteen feet; the consequence was, as the country is very low—embankments being now required to keep out the sea—the draining canals that take away the filth of the town (Georgetown) are imperfectly emptied—the river deposits its detritus in the neighborhood—a vast embankment is formed from the accumulation of these alluvial depositions, in and about and before the town, and precisely co-incident with the acme of these accumulations is the outbreak and development of epidemic yellow fever, and which is *exactly limited to this condition.* When this ceases, and this embankment disappears, the sea, now encroaching and washing it away—together with a clearance of all these estuaries, by its scavenger influence—*the yellow fever disappears.* Farther to show that this is cause and effect, *so long as the period of deposition and exposure continues, so lasts the disease—when this*

The two conditions.

Illustrated in Demarara.

And in different years.

ceases, so ceases the disease. At the termination of the last century, three years sufficed for the purpose; so in 1820–'21–'22; but, during the last occurrence, it continued about ten years—*1835–'46. Heat and moisture exists to a great extent in these low countries, robbed of the sea; so here were both blades of my "shears." Now, whether those were emanations from the *newly made* or *newly exposed earth*, formed of these alluvial depositions—producing vegetable or animal effluvia or poisonous animalculæ, in concurrence with atmospherical conditions—is not material to my purpose, or necessary to show. It is

And in Rio. the *conjunction of the two*, with the almost inevitable effect that I wish to point out, and further, that during these epidemic visitations, "atmospheric changes and occurrences of *an unusual character* are ordinarily apparent," and wherever proper attention has been paid to these, they have never been found to exist. Hence there occurs a satisfactory exhibition of all our epidemic requirements, terminating in the epidemic itself. Dr. Candido, a distinguished physician of Brazil (Rio), avers the same thing. He states most distinctly that "in addition to filth of various kinds, certain meteorological states were required to develop the fever at Rio, and these were, a temperature above Reaumur 20°, 77° Fahrenheit and humidity."*

SECTION VIII.

Localising conditions continued, and farther specified—Value of pure air—Peculiar air of cities—How and when made impure—How much spoiled every day, and value of ventilation. Bad air spoils the water—How to procure it good—Bad water promotes intemperance—influence of cemeteries--ditto of privies, street filth, &c., &c.—How much of the air from these causes will kill a bird—a dog—a man—Best pavement—What best houses—effect of low empty lots—What is not miasm—What is—Drying power not cause of fever—Fundamental proposition—Effects must arise from adequate causes—Cause of yellow fever known—Parts of cities where always breaks out—Proofs—How spread—Exact value of spontaneous cases—

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* Blair.

TABLE P.

WINDS—AVERAGE FOR A SERIES OF YEARS.

Hygrometry of Each of the Principal Winds at New Orleans, and when calm.

DEGREE OF DRYING POWER.			AMOUNT OF MOISTURE. [Saturation being 1000.]			ELASTICITY OF THE VAPOR.			WEIGHT OF VAPOR IN A CUBIC FOOT, *In grains.*		
1st	N.W.	11°.29	1st	N.W.	.677	1st	N.W.	.408	1st	N.W	5.136
2d	N.	10.06	2d	N.	.698	2d	N.	.534	2d	N.	5.819
3d	S.W.	10.03	3d	S.W.	.727	3d	N.E.	.630	3d	N.E.	6.847
4th	W.	10.01	4th	W.	.740	4th	W.	.646	4th	W.	6.915
5th	N.E.	9.28	5th	S.	.761	5th	E.	.646	5th	S.	7.181
6th	E.	8.84	6th	N.E.	.763	6th	S.W.	.664	6th	E.	7.213
7th	S.	8.21	7th	E.	.768	7th	S.	.743	7th	S.W.	7.229
8th	S.E.	7.56	8th	S.E.	.720	8th	S.E.	.759	8th	S.E	8.030
9th	CALM	5.17	9th	CALM	.929	9th	CALM	.761	9th	CALM	8.254

N. B.—To my scientific readers I observe that some few small errors in the above could only have been ascertained when the *results* were arrived at—but at too late a period to re-calculate sixty pages of figures.

TABLE Q.

Statement of the Winds in New Orleans—by Months and Seasons.

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	CALM.	EXPLANATION.
January	4.½	4.¼	5.	3.¼	3.½	1 ¾	2.	2.½	0.½	
February	4.¼	3 ¼	4.¾	2 ¾	3	2 ½	1.½	4.	0.½	
March	4 ¼	2.¾	5.½	3.½	7.	2 ½	1.¼	2.	0.¼	
April	1.½	2.¾	6 ½	4.¾	6.¾	2.½	2.¾	2.¼	0.½	
May	2.¾	2.¾	5 ½	4.	6 ¾	3.¾	1 ½	2 ½	1.	
June	1 ¾	1.¾	6 ½	4.½	4 ¾	6.	1.¾	1.½	1.	Being on an average of 11
July	1.	2.	5.	5.	6.	4.	3	1.½	3.	years—1835–'42 and '48–'50.
August	3.½	3.½	4.	3.½	4.½	4.	3.¼	1 ¾	2.	
September	6.0	6.½	6.¼	1.¾	2.¼	1.½	1.¾	1.¾	0.¾	
October	6.½	5.¼	7.	1.½	1.¾	1.	2.	3.	1.	
November	5 ¾	1.	4.¾	3.¼	3.¼	1.	1	3.½	0.½	
December	7.¼	4 ¼	5.½	3.	3	1 ¾	1 ¾	1 ¾	1.½	
BY SEASONS.										
Winter	16.	11.¾	15.¼	9.	9.½	6.	5.	8.½	2.	
Spring	8.½	8.¼	17.½	12.	20.½	8 ¾	5.½	6 ¾	1.¾	Total number of days'
Summer	6.¼	7.¼	15.½	13.	15.¼	14.	8.	4.¾	6.	wind each season.
Autumn	18.¼	12.¾	18.	6.½	7.¼	3.½	4 ¾	8 ¼	2 ¼	
Winter	1st	3d	2d	5th	4th	7th	8th	6th	9th	
Spring	5th	6th	2d	3d	1st	4th	8th	7th	9th	Relative frequ'cy of each
Summer	7th	6th	1st	4th	2d	3d	5th	8th	9th	wind during each season.
Autumn	1st	3d	2d	6th	5th	8th	7th	4th	9th	
BY THE YEAR.										
	3d	5th	1st	4th	2d	6th	8th	7th	9th	Relative frequ'cy of each
	49.	40.	66.¼	40.¾	52.½	32.¼	23.½	27.¾	12.½	wind during the year.

ERRATUM.

On "Radiation Chart"—opposite,—for "*Radiation of the Sun,*" read Radiation.

Several mentioned—What they prove—Prescription to produce yellow fever—The cause of yellow fever proved—Philosophical rule—Clear deduction—Practical value—Hope for New Orleans—Our duty–Value of truth in Medicine–Health first great object in government—Insalubrity of a city punishable offence.

Let us proceed to the second branch of the localising conditions in the production of yellow fever.

This subject would hardly admit of an array of facts, or attempt at argument in its support in the present enlightened and advanced state of society, had not some doubts been thrown upon it, and their influence impugned of late.—Indeed, in few things is the progressive march of the age we live in more strongly characterized, than in the efforts to improve the sanitary condition, by the removal of the filth and offals of society, as destructive to its welfare, as the effete and worn out parts and excretions of the human being is to it individually. The care bestowed on these objects is at once a test of high civilization and of personal refinement, and the performance of one of the very first duties of civil government, as highly conducive to the preservation of the health and lives of its citizens. The history of man proves this in every age and nation; and as attention to these indicates the progressive improvement of nations, so, their neglect, in a similar manner, is a conclusive proof of their decline. In no countries are these more eminently illustrated than in what we read in the history of the successive rise and decline of ancient and modern Egypt and Rome, in their several revolutions; and it is farther demonstrated most clearly, that with this blessing comes a higher tone of public and domestic morals—greater elevation of character—improvements in the comforts and enjoyments of life—and with them a greatly increased average duration of it.

Attention to sanitary measures a test of civilization and refinement.

At this enlightened day to believe in the existence of an effect without a cause, is to confess one's self an atheist. To express a conviction of the impossibility of man's altering or influencing his physical condition, and, of course, all its consequences, is to acknowledge one's self a fatalist. The Su-

Providence influences man through secondary causes.

preme Being acts upon and influences all conditions and circumstances on earth, *through the means of secondary causes.* These act by laws impressed on man's being throughout his existence, and there exists as surely *laws of disease* as there are *laws of health.* If a man infringes on the latter he falls under the influence of the former. In other words, in some climates—some circumstances and conditions in which man is placed, either willingly or unwillingly, knowingly or ignorantly, his health suffers as a *consequence.* If these are changed he regains his health. All *hygienic and sanitary* regulations, all *curative processes* are based upon these principles; without them we are *brutes*—nay worse—for many of them apply remedies to ailing conditions. Disease may be considered a *resulting* punishment for an infraction of the laws of health. In civilized communities, where life is highly valued, preventive or corrective laws are made, that this should be avoided, and special bodies are designated to point them out, and see them enforced, and to take care of the health of society, that the great mass are ignorant of; and these are called in our country "Boards of Health," "Health Departments," &c.

Illustrations.

The localising conditions consist of filth and impurities of all kinds, in the largest sense, constituting the great physical enemy of the well-being of man, as street and kitchen offal, the refuse of stores, the drainage of sugar and molasses hogsheads, of stables and vacheries, with deficient ventilation, slaughter-houses, soap, tallow and bone manufactories, privies, cemeteries, swamps, and the defective drainage of towns; it is concentrated in hospitals and crowded dwellings, where many diseases originate, and others cannot be cured without removal. It exists, to a proportionate extent, wherever there is a defect of domestic and personal cleanliness; in fine, *whatever impairs the purity of the air we breathe, the food we eat, or the water we drink.* They are all resolvable into the first, for it is through it mainly they obtain access to our aliment and drink, and through the lungs reach the source of all vitalization.

Filth the great enemy of health.

What it is.

It has been as truly as beautifully said,* that though we

* Girdlestone.

do not see the air, we feel it, and what is more, we breathe it. We live by breathing it, insomuch that it has been well said, that as plants are the children of the earth, so, men are plants of the air; our lungs being, as it were, roots ramified and expanded in our atmosphere; and this, in fact, is the chief avenue by which the filth and damp of towns that are not well drained and cleaned introduce their poison into the human constitution. The putrifying refuse, whether animal or vegetable, solid or liquid, becomes dissolved into various kinds of gas, all the more commingled with the common air as this is damp and warm. These principally constitute the special difference between the air of urban and rural districts. It is estimated that at least one-third of the life of civilized man and even much more in cities; (nay, if it was reversed, and say that more than two-thirds of our time) is spent in the confined and, to a certain extent, deteriorated atmosphere of houses and apartments, where there necessarily must exist defective ventilation, where the atmosphere has to be breathed over and over again, with all its organic matter running through every stage of decomposition, besides other sources of vitiation, surprise should no longer be felt that a city atmosphere abbreviates human life.

Indispensable nature of pure air.

Amount of time spent in the house.

There is a peculiar air hanging over and constituting that of large cities and all extensive aggregations of human beings or animated life. The more sensitive of our race easily perceive it. Asthmatics are sensible of it, on entering or leaving a city,—children—delicate females—convalescents—those in feeble health; indeed, it is experienced by most persons on leaving a close city atmosphere, and particularly if proceeding where one is exposed to the influence of sea air; and this is apparently independent of ventilation, for, although to the *windward* of it you are still sensible of the *city air.* When acting as Chief Health Officer at Vera Cruz, during the Mexican War, it became my duty (as Surgeon U. S. Army and Chief Health Officer) on one occasion, to visit a mariner on board a vessel that had arrived some hours before, and anchored some two or three

Peculiar air of cities.

miles from the port, to windward. I found it a case of yellow fever, which was then prevailing in Vera Cruz—the vessel having come from a healthy port. She had not communicated with the shore, except through her first officer; so neither the wind nor the officer could have communicated it. It is a curious and well known fact, that oil, thrown upon the waves, will pass to windward as well as to leeward. Such may have been the case in the instance just cited, although I would not wish to be understood to mean, that all ærial poisons are not more readily conveyed by the winds. Indeed, we know they are so. I only desire to express the opinion, that it depends upon a concentrated city atmosphere, which, under certain circumstances, no wind can dilute to innocuousness, it may become diffused by expansion, as the temperature is greater. This is experienced in all large cities; and in all, there are portions where this impure air exists to a much greater extent than in others. This is more eminently true of the Northern cities, where there is such a difference in elevation, dryness and ventilation, than here. Still, there are localities here where these differences exist to a notable degree, and which are the special hot-beds of pestilence wherever it exists, as in the neighborhood of St. Thomas, Madison and St. Mary streets, the triangle, about Gormley's Basin, some of the front streets of Lafayette, and finally, the Seventh Ward. These are damp, filthy, crowded and badly ventilated, and the results are such as should call forth the corrective influence of a paternal government. There is said to be a street in Charleston, never visited by yellow fever, on account of its great cleanliness; and there are healthy and sickly parts of all cities, as we shall by-and-bye point out. Now, it is evident, the nearer we make a city approach the condition of the rural districts, the nearer it will reach a state of salubrity. Our neighboring parishes had an average mortality, in 1850, of less than two per cent. The average for this city, for the last seven years, has been near seven per cent. The difference is seldom more than 40 per cent., according to the reliable investigations of vital staticians, (between town

It spreads everywhere.

Parts of cities most filthy, and therefore sickly.

Proofs.

Test of a city's insalubrity when it departs from that of its neighborhood, and shows it to be artificial.

and country), while here we find it more than 350 per cent. That this enormous difference proceeds from removable causes, will be shown hereafter. There are few cities but what would be ultimately depopulated, did they solely rely upon their own native population for increase, from the results of the concentration of their own filth and congenerous sources of vital degeneration. All, and especially sickly cities, owe more or less to immigration, their growth and progress. Hence, their special value to us, as important means for our advancement and prosperity.

Every time we breathe, and this is repeated about eighteen times per minute, we vitiate the air taken into the lungs, by retaining a portion of one of its constituent elements, which combines with our blood, refreshing and purifying it—rendering it fit for the purposes of life—whilst we return, the remainder, with an additional ingredient, quite unfit to be breathed over again, either by ourselves or any one else. Hence it follows, that were a person shut up in a small chamber, perfectly air tight, he could not live through a single day. Each individual in the course of the night, vitiates about three hundred cubic feet of atmospheric air, rendering it totally unsuitable for the purposes of respiration; and no room should be tenanted that does not furnish *at least* six hundred cubic feet of air to each individual occupant. The inspectors of prisons in England recommended not less than one thousand cubic feet for every prisoner, as being "essential to health and preservation." It is known, that a canary bird, suspended near the top of a curtained bedstead in which people have slept, will generally, owing to the impurity of the air, be found dead in the morning. And it is computed that the population of a crowded town, by the mere natural action of the lungs, in the course of twenty-four hours, vitiate a layer of air as large as the whole area inhabited, at least a yard in depth or thickness—to say nothing of the amount spoiled for all the purposes of respiration by fires and furnaces, lamps, candles, gas and all manner of deleterious manufactories. Indeed, were it not for the provi-

Amount of air required for respiration.

Size of rooms.

Amount of air vitiated in a crowded town per day.

dential arrangement, that the air thus vitiated by the lungs becomes at the same time heated, and is therefore always in motion to ascend, making way for fresh air to take its place, we should be in constant danger of suffocation whenever we were in a room without a draft, or in a town without a wind stirring. This shows us the importance of so constructing streets and courts as to make the most of the *natural movements* of the atmosphere in the climate in which the town is built. For instance, in this city, to obtain the most perfect ventilation of our streets and thoroughfares, during the summer and autumnal months—the most important period, when our salubrity is most liable to be influenced by bad air—the streets should, were it possible, run East and West and North and South, and always be at right angles, to prevent obstruction and permit perfect ventilation.*

Absolute necessity of ventilation.

How promote this.

These valuable reports are so full of important practical matter, and so applicable to our situation, that I am tempted to quote extensively from them. It is proved by them, "That the rate of sickness and mortality, of the working classes in their populous towns, is much greater than that of the same class in the country districts, and much greater than that of these classes in the same towns, where dwellings are better drained and better ventilated. It is proved, that the greater liability of the working classes to the most afflictive and painful disorders, does not arise from deficiency of food and clothing, but from their living, usually with no alternation, in narrow streets, confined courts, damp dwellings and close chambers, undrained, unventilated, uncleaned. It is proved, that they suffer most severely in those cases where they spend the day in crowded workshops, or where they live in cellars, or sleep in rooms on the ground floor, or in chambers that have no chimney place, or other vent for vitiated air. It is proved, that in such situations, the average duration of human life, is at least twenty years less than it otherwise might be; and that, during this curtailed period of existence,

Necessity of drainage.

Diseases not from defective food and clothing among the poor, but from crowding and filth.

Cost of removing filth but a small part of the annual cost to relieve,

* Vide Report General Board of Health of England,—and table of the Winds here.

the working power of those who live, is seriously diminished, and much more in their capacity for enjoyment, by a constant depression of spirits and health, and by the active attacks of fever, cholera, scrofula, and consumption. It is proved, that this excess of mortality falls most heavily—first, on the infantile portion of the community, and next, on the heads of families, between twenty and thirty years of age. It is proved that the burdens which are thrown by this excess of sickness and mortality on the poor's rates—to say nothing of infirmaries and dispensaries—of friendly societies and of private almsgiving, is such as to exceed the cost of effecting those improvements which would suffice to make the average health of the working classes nearly equal to that of the rest of the community. And it is further proved, that there is an incalculable amount of demoralization, attributable to the same causes, and that an effectual bar is thus put to the intellectual, moral, and religious improvement of this large portion of the community."

Resulting demoralization.

The influence of crowding, production of bad air, and the want of ventilation, is eminently illustrated on the crews of collier vessels on the Thames—although well fed, in the prime of life, confined at night and in bad weather to the narrow limits of the forecastle, the sickness and mortality is large. Such is the cause, also, mainly, of the immense mortality on board immigrant ships, crossing the Atlantic. In Northern latitudes they die of typhus and cholera; in tropical climates of yellow fever, and the mortality, everywhere, has been proved to bear a pretty accurate proportion to the closeness of the crowding. The deleterious agent, consisting of the effete excretions, has been proved, experimentally, to consist of highly putrescent organic matter, mingled with the expired air. That it is, when re-introduced into the living body, liable to be highly injurious, may be inferred from the fact of the careful provision made by nature for its incessant elimination from the system. That it is small in amount, is no objection to the intensity of its

The poison from crowding is organic matter as well as carbonic acid.

action; for to the physiologist it is well known, that a minute quantity of a powerful agent—the putrid matter introduced on the point of a needle, in the inspection of a dead body—a single drop of concentrated prussic acid, placed in the mouth of an animal, is sufficient to destroy life. It is in our crowded bed-rooms, in unventilated schools, upper dormitories, in overcharged wards of hospitals and jails, that this effete matter taints the air, and, entering the blood, poisons the system.* It has been before said, that this expired air consists of two ingredients—carbonic acid, which mixes with the atmosphere, on the principle of diffusion, whilst the other, being an animal excretion, no longer held in solution in the colder external air, is deposited and particularly clings to woolen articles or bedding—clothes which are well known to retain this offensive smell a long time. Hence the value of frequently airing these domestic articles.

Comparison of air with food.

In an examination before a committee of the House of Commons, the venerable Dr. Farr had occasion to state, the relative value of pure atmospheric air, as vital food to the grosser elements of bread, flesh and water, and said, most forcibly: "If a human being be deprived of these aliments, he dies in a period varying from eleven to nineteen days; but, if atmospheric air be excluded from his lungs, he dies in a minute; therefore, the relative value of atmospheric air to bread, flesh and water, is as fourteen days to one minute, and the *deterioration* of the atmosphere in which human beings are residing, produces a deleterious effect on life, in proportion to that deterioration."

Necessity of ventilation.

The necessity of *ventilation*, and the injurious effect of a stagnant state of the air, has been noticed as far back, by medical writers, as the time of Hippocrates. By reference to the Table of the "hygrometry of the winds," it will be seen, that while it is *calm*, that it is most replete and of course, with all that moisture can dissolve or hold in suspension, and that, consequently, active perflation is indispensable to purification. It is well known that where the wind blows freely and strongly, or finds no ob-

* Granger.

stacles from surrounding objects, localities, which otherwise might be expected to be fruitful sources of fever, may be visited or inhabited with impunity, while similar places become insalubrious if the air is stagnant.* "Calms," says Dr. Drake, "permit the exhalations from foul localities to accumulate in the atmosphere which rest over them; but all winds operate to disperse and dilute them with purer air." The late Professor Hallè, one of the magnates of the Medical School of Paris, in an able report on the condition of the river Bievre, near that city, pointed out the fact, that the pernicious effect of the fœtid exhalations issuing from the river, are harmless in situations, where the atmosphere circulates freely, and is renewed by strong and unimpeded currents.†

Organic matter always in air.

In the proceedings of the British Association, we find an interesting report by Dr. Smith, on the air and water of towns, which is too important, from its direct applicability to the subject before us, to pass over without culling a portion of its interesting matter. "If," says he, "air is passed through water, a certain amount of organic matter poured off from the lungs, is to be detected in it." By continuing this process for three months, Dr. Smith detected sulphuric acid, chlorine, and a substance resembling impure albumen. These substances are constantly being condensed upon cold bodies, and in a warm atmosphere, the albuminous matter very soon putrefies, and emits disagreeable odors; this is the ordinary smell of close rooms, producing offensiveness, when space is disproportioned to the number of occupants. Such was eminently the case last season, in yellow fever rooms, when not properly ventilated. By eramucausis, this substance gives rise to carbonic acid, ammonia, sulphuretted hydrogen, and probably to other gases. By collecting the moisture of a crowded room by means of cold glasses, and also dew, in the open air, it was proved that the former was thick and oily, capable of decomposition, and productive of animalcules, while the dew was beautifully clear and limpid. Large quantities of rain water have been examined by Dr. Smith, and

* La Roche. † La Roche.

he says: "I am now satisfied that dust comes down from the purest air, and that it is simply coal ashes." The rain water of Manchester is considerably harder than that of the neighboring hills. This can only arise from the ingredients obtained in the town atmosphere; but the most curious point is the fact, that organic matter *is never absent*, although the rain continues for several days. The state of the air is closely connected with that of the water; what the air contains, the water may absorb, and what the water has dissolved or absorbed, it may give out to the air. It was discovered that all organic matter in filtering through the soil, is very rapidly oxidized. The nitrates he found in the London water, prevent the formation of any vegetable matter, so that none can be detected, even by the microscope, after a long period. In summing up the results obtained; Dr. Smith remarked, that the pollution of the air in crowded rooms, is really owing to organic matter, and not merely to carbonic acid, that all the water of large towns contain organic matter; that water purifies itself from organic matter, in various ways, but principally by converting it into nitrates—that water can never stand long with advantage, unless on a large scale, and should be used when collected, or as soon as filtered.

Notwithstanding rains.

Water absorbs whatever air contains.

Water rapidly absorbs noxious gases, and is always injured when exposed to their influence. In this city the cisterns which usually furnish most of our drinking and cooking water are commonly placed in close proximity, in our narrow back yards, with the privy, bituminous coal, and all kitchen and house refuse, and sometimes becomes so much impaired in its purity as to be utterly unfit for use. Professor Hoffman has stated that such is the capacity of water that one thousand gallons of it will dissolve twenty-five gallons of nitrogen, one thousand gallons of carbonic acid, fifty thousand gallons of ammonia, the very gas which escapes so largely from privies, and the police filth of every dirty town, carrying with it vegetable and animal matters in a high state

Absorptive power of water.

* Grainger.

of putrescency. From hence it will be seen how important it is that the drinking water, and that used for domestic purposes, should be brought *underground* from the *rural districts* at a distance, and that the plan suggested on the erection of the British House of Parliament, to ventilate the building by the introduction of *air from the country*, was a very wise one.

Experience has already shown that those who use rain water in preference to *any other*, and more especially, filtered river water, are much less subject to *cholera* when it prevails, than those who use any other kind of water, and of course, it follows in congenerous affections, as diarrhœa, dysentery, the bowel complaints of children, &c., indeed, experienced men are so well aware of this, as sometimes, to have the water *boiled*, they allow their sick in some delicate disturbances of the digestive organs, and keep it well corked for use. The effect of boiling it, is to purify it, by removing the noxious gases it contains, and for the deposit of its principal earthy materials. In large cities where the water is very apt to be impure, it can scarcely be used alone, hence the temptation to mix it with alcoholic beverages, giving grounds and furnishing temptation to intemperance, and it is a valid one. To support this holy cause then, and to keep up the healthy habit of drinking water alone, the water must be kept pure. The real and true relation, between moral and physical degradation, is now beginning to be correctly appreciated under the improved sanitary states of all classes of society, and the important truth is being demonstrated, that the moral as well as the physical condition may be greatly ameliorated. Ministers of the law, as well as of religion are discovering that the scavenger and the architect are among their best allies.*

Value of rain water if kept pure.

Moral and physical condition dependent on similar circumstances.

Food is injured by bad air, and more particularly by moisture, as flour and all the ceralia—meat by moulding, and speedy putrefaction, and salt food, as fish, pork, &c., by the salt attracting the moisture of the atmosphere, and liquifying. Sugar and molasses also attract moisture, and are injured by heat,

How food injured.

* Rogers.

ferment and become acescent, run off and impair the purity of the atmosphere, and thus all are injured by the climate, and add their mite to impair the general salubrity.

Injuries resulting from cemeteries.

There is probably no climate in America where the vicinage of *cemeteries* would and does do, so much damage to public health, as here.* Rapid and prolonged decay results from the great moisture of the climate, and comparatively small desiccative power. Burying, almost universally above ground, (in the cemeteries of the city) the mortar connecting the brick work soon splits, giving exit to injurious exhalations from the within decompositions. The force of the gases (and especially under the augmented temperature of summer, when they are most injurions) are often so very great as sometimes to burst the leaden coffins, (when made of it,) and always to escape through the pores of the wooden ones, and to split the metalic ones and the brick and plastered work of the vaults, contaminating the atmosphere for a great distance around. In no case then, if permitted in cities, should a dwelling be permitted nearer to these yards than several hundred paces, according to the frequency of interment.

How soon bodies decay.

The period in which the body is undergoing decomposition, varies according to its age and size, the season, and the more or less exposure and completeness of the tomb. The sextons inform me, that three to six months is an average period. Let it be longer or shorter, the process is constantly taking place, and any visitor to the grave-yards can easily satisfy himself that the confinement of the decomposing bodies is too imperfect for the safety of the community. In those countries where tombs are not used, the body is disturbed for the repetition of the interment, before it shall have become indistinguishable from the soil.

Number of bodies to the acre annually.

The amount of space recommended in countries more regardful of the public health than here is that there should not be much above one hundred burials annually in an acre of ground. In some of our cemeteries in and near the city, that do not embrace many acres, thousands are buried in every year.†

* See Map. † See Cemetery Report—Table G.

The following regulation, (introduced by Lord Palmerston,) which is in force in the burial grounds of London, is eminently applicable to those in this city, if they are to remain, and those without the city, that "no interment shall take place within ten yards of any part of the boundary of the city cemetery, and that the intervening space shall be planted with shrubs, evergreens and trees, in such a manner as shall promote the absorption of any deleterious emanations, and at the same time permit the circulation of the air. Also, that the cemetery shall be underdrained, so as to prevent the accumulation of water in the graves and vaults, and that no grave shall be opened until after a lapse of fifteen to twenty-four years, according to the age of the parties."

Regulations in London.

The sentiment now almost universally prevails, that intra-mural interments should be forbidden, as no less inconsistent with due respect to the remains of the dead, than with a safe regard to the health of the living; and that, as perfectly compatible with both, the beautiful custom, so full of delicacy and taste, so accordant with some of our most sacred feelings, should be encouraged, of erecting rural cemeteries, on spots retired, and distant from the busy hum of human intercourse that the holy feelings due to the last remains of our kindred and fellow-citizens should not be obtruded on by either levity or business, but be in harmonious association with that beautiful kingdom that God has made for our comfort and enjoyment.

Intra-mural interments substituted in rural cemeteries.

Probably, there is no cause so productive of bad air, and so difficult to be gotten rid of here, as NIGHT SOIL and *street and back yard filth.* It is *the great difficulty* everywhere. In this city, we are peculiarly situated in regard to both; we cannot dig pits of more than two feet anywhere without coming to water, and in the back parts of the city, to half that distance, this being dependent mostly upon the amount of rain recently fallen, not on the height of the river, as supposed. This makes it the worse, as in the summer season most rain falls, and the evolution of the gases greatest and most injurious. Hence, open pits (as night soil is lighter than water, and is always on the surface, giving its noxious gases to the atmosphere) are not applicable to our position; and street filth is not required for manure in our fine alluvial soil. If we reflect for one moment upon the offensive fact, that near five thousand six hundred tons of night soil, and about fifty thousand tons of urine are exposed here aunually, to undergo the process of fermentation and decomposition, exhaling their noxious and poisonous gases to the atmosphere we breathe, and absorbed by the water we drink, contaminating our most private recesses, (for there they are generally located,) where the air being mostly stagnant, it is apt to remain permanently. The amount of manure from domestic animals, of kitchen offal, is at least as much more—of more than five thousand bodies, buried within the city limits—of street and gutter filth, constantly undergoing decomposition—with its frequent *upturning and spread upon the streets*, (not *immediately* removed, however, as it should be,) by the scavengers—probably, four times as much more. Then, we have the frightful aggregate of upwards of three hundred thousand tons, the larger part of it of organic decomposed and decomposable matter, submitted to the putrefactive fermentation every year, under our very noses, besides that from gas works, tallow and soap chandleries, &c., &c., in an area of seven and a quarter square miles, together with the baneful influence in almost every direction, of swamps uncovered and covered by forest growth, and all this in a temperature which, for nine months in the year averages 73°.31, while there is an average humidity during that period of .820, or within .179 of actual saturation! This is bad enough if it cannot be remedied, and too bad if it can!

Amount of filth exposed to constantly, and to be disposed of.

The area of the city temperature and moisture.

On investigation by the General Board of Health of England, on the influence of *livery stables and vacheries*, they were found to be so injurious as to be denominated "fever nests," and so pernicious even to their own tenants (cattle) that the manure was ordered to be kept in covered receptacles; and in relation to slaughter-houses, they were found not only injurious to health, and offensive to sight and smell, but the poisonous atmosphere was even found to injure the quality of the meat, disposing it to taint, and promoting its rapid putrefaction. In some of these houses, the meat would scarcely keep sweet thirty hours, and such I have found to be, on inquiry, a general fact here.

The special gases, the principal effluvia eliminated from privies and the other sources of vitiation just mentioned, is known to be composed, mainly of sulphuretted hydrogen and ammonia, and experimental physiology* has shown that one cubic inch of this gas, in 1500 cubic inches of air, will kill a *bird*, and one cubic inch in 800, will kill a *dog*, and that a *man* cannot live, where the air he inspires is impregnated with a 300th part, and suffers in a corresponding degree when a less proportion of these poisonous gases exist. Matteuci informs us, that sulphuretted hydrogen is the only body, which, having acted on the blood, even in very small quantities, renders this fluid incapable of being arterialized by oxygen.

Amount of this gas to poison a bird. A dog. A man.

Streets, as a source of disease, are much dependant upon the qualities of the soil of which they are composed. If sandy, although to the eye, cleaner, they *absorb and retain* all the filthy materials of a liquid nature, that falls upon them, until an elevated temperature gives them back to the surface, in the more, and indeed, only poisonous condition of an æriform compound: this, it is well known, constitutes the most dangerous ballast of ships, and it is from this cause. The "cleanliness" of such streets, is illusive—deceiving, by appearances, their vicious deposits—*concealed, not destroyed.* Streets of clayey materials and partly of sand and vegetable mould, such as compose our streets, whose absorbent power is less, retain, on the irregularities of the surface, what is not absorbed or passed off, and exhale it to the atmosphere, keeping up a high degree of saturation, with it in solution.

Streets as a source of disease. What good and bad.

Houses, in a climate like ours, should be so constructed as to promote the maximum of ventilation and the minimum of moisture and temperature. Where these are not fulfilled, with a proper protection from the inclemencies of the weather, (hot

Houses.

* Thenard & Dupuytren.

and cold) they fail in their objects. The admission of light, too, is important in the construction of a dwelling, to the enjoyment of health and the prevention of disease. It renders disease milder when it occurs, and makes it more readily amenable to medical and other treatment. There is reputable medical testimony to prove, that some diseases, in dark alleys and cellars cannot be cured, without it. Dark corners and places in dwellings are always the hiding places of dirt and filth, and particularly in the habitations of the poor.

How to be constructed.

Our *empty squares and half filled lots*, are pregnant sources of disease. These require as much, or more, attention than streets, as they *are eight or ten times* more extensive and more replete with every kind of filth. Often, in secluded, unventilated spots, they constitute so many receptacles and fountains for the evolution of that poisonous material that is so fatal to the public health. Hence then, the vigilance of the authorities is ten-fold more required *there*, than in the streets, where so much negligence takes place before the very eyes of the community. Little is done (while they are neglected) to purify the atmosphere, if these efforts, limited and spasmodic as they are, shall be confined to the streets, if they should be left to private apathy and indifference.

Empty lots as a source of disease.

The various hypotheses based upon the supposition of a *specific* something, which is denominated MIASM, eliminated by the decomposition of organic matter has been shown to be so utterly untenable by its several opponents respectively, of any *one thing* possessing this multifarious and mighty power, that we have for many years abandoned the whole as untenable, and that of the "drying power," among the rest, which, having nothing definite in the form of reasonable experiment to support it, or rather in defiance of it, and in the very face of experiments which utterly disprove it, that I have long come to the conclusion that there is no such *specific agent*, but believe them all right and all wrong, when exclusive, and that *whatever impairs the purity of the atmosphere is pro tanto*, for the time being, *the miasm*, or rather the *mal-aria*. In a practical report,

The true miasm is whatever impairs the purity of the air.

such as the present is intended to be, it is no place to offer the the explanations which have satisfied my mind iu relation to what is called the "*laws of miasm.*" We profess to deal with well established and incontrovertible facts and to make them the basis of all our suggestions for future improvement; we may, nevertheless, be pardoned if we find it requisite *for necessary explanation*, to exercise the privileges belonging to the first advance in science, and brush away the cobwebs, and show what this alledged cause *is not.* We then proceed to show that the explanation which they have attempted, in relation to the *disturbance of the soil*, is utterly irreconcilable with the facts, and *it is for that purpose* that we depart from the purpose laid down for our guidauce in this paper.

The cause of this influence, indeed the cause of all what is called *malarious* fevers, (bilious and yellow fevers inclusive) has beeu ascribed to "the *drying process*" in soils recently or not long since saturated with water, without direct proof, with no allegation of experiments, and with no other evidence than that there "has been a hot sun and preceding moisture." Now, I might content myself iu stating, that the hygrometer is the only recognized suffcient test of the existence of this "*drying power*," *and the amount of moisture in the atmosphere*, and there is neither allegation or evidence that this has been used. That when these injurious influences take place in the *highest degree*, *the drying power is at its minimum*, and that the moisture is usually then at its maximum; the meteorological tables accompanying this Report, show this in a most conclusive manner.

Supposed cause of fevers.

No proof.

The main ground furnished by Dr. Ferguson, who is the author of the hypothesis, is, that during the period of a great drought in the hilly districts of Spain, the streams were dried up, and the British troops were encamped in their beds and hollows, (I quote from memory,) and so fatal was the fever resulting, that all Europe thought they were annihilated! To experienced Southern physicians it is well known that there are *no places* so fatal to health as these beds and similar apparently *dry hollows and their outlets*, and that it is in proportion to their insulation from ventilation, and that it consists of a stagnant,

Explanation of Dr. Ferguson's hypothesis.

damp and poisonous air; that it was this that was so fatal to the British army, and not the drying process. There is no doubt that if the Dr. had experimented with the hygrometer it would have informed him that the air was *saturated with moisture* during the greater part of every night, and that if he had dug into the beds of the late streams he would have found water not far distant.

Solution required for absorption into the system.

All the theories of miasm singularly fail, in attempting to prove too much. A specific miasm, eliminated by decomposition out of organic matter, must and should, as is alledged, produce disease under all circumstances; so far as lining the lungs it is composed of organic matter, passing the most delicate membranes into the system, is deemed utterly incompatible with that demonstration made by our able colleague,* viz: that nothing can pass through those membranes *unless in a state of solution*, in which state the organic character must be lost! the physiological condition of the individual, and the existing meteorological state being entirely out of the question.

Why it can't be the "drying power."

The advocates, however, of the influence of the "drying power," do not so interpret the modus operandi of their agent, nor present us the philosophy of it. Malignant fever is most apt to seize an individual about daybreak. This is supposed to be owing to an alledged great fall in the thermometer at that time, instead of ascribing it to a change in the *physiological condition of the individual then always occurring*. The most frequent hours for the attack of malignant disease (yellow fever, cholera, plague, &c.) being after midnight, or early morning hours, *being precisely those periods* known from statistical investigations as most fatal to human life, or when it is most apt to terminate, three to six. The real difference between bed-time and daybreak is only three to four degrees, by *actual observation*, and

So from a physiological cause, or hygrometric.

this, too, is always a *gradual, regular decline*. Now, if it is due to any meteorological condition, it is to the hygrometer, for I have often noted a difference of half a degree in the temperature of evaporation between day-break, my usual time of making it,

*Prof. Riddell.

and half an hour to an hour before; that it is that much *lower;* the evaporating power is that much greater; that it rises at daybreak; while I can perceive no difference in the dry bulb thermometer, placed by its side. Again, a fall, a moral emotion, anything that suddenly shocks the nervous system, and particularly, during the existence of a mortal epidemic, produces the development of the disease, although, but for this, no such occurrence would probably have happened. The "drying power" is most active at midday, and is at its minimum at night, when the air is almost saturated with moisture, and often entirely so in sickly seasons, as during our epidemic last season, yet, yellow fever, as well as the whole zymotic class, is very apt to occur at this time, and in seasons and regions where this exists in the greatest degree, is precisely there where they are most rife, and where the *drying power is greatest, and the air elastic, is just those where there is most health!* During the greatest droughts, there is always a provision of nature in the subsoil for the necessary supply of moisture, as well as in the atmosphere. The term is but one of comparison; were there *no moisture* existing at the time, vegetable as well as animal life must cease. I have often noted, during what was called great droughts, the air, at my morning observation, *saturated with moisture,* and during the "dry season," on the elevated plateaux of Mexico, I have seen the dews so heavy as to wet the road half an inch or more in depth, which at first I attributed to rains during the night, and many a time have I descended from my horse at daybreak to examine it. The country is rarely sickly when simply dry. The driest portions of the Southwestern States are the healthiest, as may be seen by reference to the maps I have constructed of those States, derived from the mortuary returns of the last census, and published in the fifth volume of the Transactions of the Am. Med. Ass. Pensacola, Mobile, Bay St. Louis are dry more in appearance than in reality.* Their absorbent soils permit a percolation of water to the clayey subsoil, but a few feet below, beyond which

Always moisture in the atmosphere.

Absorbant soils only apparently cleanly.

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*I have tried for years, in vain, to procure a record of their hygrometrical condition.

it cannot proceed, and it then becomes a reservoir for an evaporating temperature, whenever this occurs. That this is reasonable, is demonstrable from what we know of subsoil moisture under a high temperature. I know it further from my own experiments. That this was the case at the disastrous encampment at Walcheren, where the moisture could be easily reached by thrusting a walking cane into the sand, and the notoriously fatal spot opposite Lisbon is as remarkable for its luxuriant mushrooms as for its mortality, and we very well know that these flourish only in very moist situations. The periods and places of the occurrence of the epidemic of last year, as traced out in Prof. Blodget's interesting communication, showed most conclusively, that the epidemic, only broke out as the country became moist, that as long as it continued dry, whatever was the temperature, and it was very elevated, health remained; and finally, what is better established, from long and well attested experience, than that one of the most prolific sources of foul air and bad smell in ships, has been the putrescent matters absorbed and retained by gravel, sand and other earthy substances used for ballast, and that however apparently clean ships are kept by washing, they are never as healthy as when this process is effected by dry rubbing by the "holy stone," as it is called. The "drying process" always exists in the proverbially healthy occupation of ploughing, which is only injurious during the *first* process or year of exposure. The simoon is a *drying blast.* It sucks up our fluids, and desiccates everything it reaches, but it has never been accused, so far as I have heard, of producing *fever*, much less *yellow fever.* Nevertheless, I so far agree with these gentlemen as to ascribe much influence to the drying power in the production of influenza, pneumonia, catarrh, rheumatism, and even *cholera*, &c., but so far as my experience and researches have gone, not bilious or yellow fevers, and these experiments have extended over many years and climates, and during the worst fevers known in the South.

Conceals, not destroys filth.

Healthy as long as dry.

Let us repeat, then, our conviction, that *no one agent* produces what is termed malarial fevers, but that they depend for their existence upon *the two-fold condition* expressed in the former part of this Report.

A two-fold condition requisite.

A fundamental proposition, an imposing truism of sanitary science, is, that every effect springs from some adequate and commensurate cause. This is a law of nature, as applicable to disease as to anything else. No disease can arise and pervade a country, or section of country, or even attack a single individual, without being due to some atmospheric, local or personal cause, the discovery and extirpation of which will at once arrest its further diffusion. The curative physician seeks for the causes of disease, for the purpose of more thoroughly comprehending their mode of action upon the human economy* in order to apply the proper remedy. The sanitary reformer pushes his inquiries into the "field of causation," for the purpose of *preventing* those ills which it is the province of the other to palliate or *cure*. The one endeavors to ameliorate the ills to which individuals at present prove subject, while the other has a far nobler, and philanthropic object, to prevent the ills to which whole communities are subject.

No effect can arise but from an adequate cause.

Difference of curative and preventive science.

If, in the present state of this interesting inquiry into general and special causes, we find certain effects invariably to follow, and in the same relation, it requires no great sagacity to ascribe the one to the other; nor any rare gift of prophecy, to foretell that, on the occurrence of the one, we may reasonably expect the other. Such are the circumstances that characterize the occurrence of yellow fever in this climate, the *invariable sequence* to *extensive* disturbance of the original soil, with the atmospheric and local conditions to be pointed out in more detail presently. There are many diseases with whose causes we are utterly ignorant, at present, but with which we shall doubtless become acquainted hereafter in proportion as we acquire a more accurate and minute acquaintance with the laws and constitution of the atmosphere of the climate we live in, and with the physiology of organic

Cause and consequence.

Must be a cause for every disease.

*Rodgers.

life. It is thus with leprosy, elephantisis, syphilis, and most of those now recognized as due to specific poisons. In relation to epideme cholera, we may be ignorant of its precise cause, but in the progresss of a study of the conditions which influence it, we will become acquainted with the accessory, preventible and instigating local circumstances which *influence* it, the localising circumstances that are *under our control.* So of yellow fever; the *exact* amount of causation, either local or general, the *sine qua non*, to its production, we can scarcely measure, from defect of accurate and precise observation; yet I am most fully impressed with the conviction that we are sufficiently acquainted with its ordinary causes to *prevent it*, which is the only valuable or practical part worth knowing. If we can control these then, we shall be exempt from this terrible scourge. It is particularly here that false facts and imperfect information have done so much injury, and thrown a cloud upon the subject it is so difficult to dispel. If then, we can clearly prove the *places, the very spots and parts of cities* that are the favorite haunts, *nidus, birth-place and field of growth of this disease, if with increase of the alledged cause, the effect is in proportion multiplied, if with its limitation the effect is also limited*, and if with this removed the effects also cease it will go far to show, not only the *cause* of the disease itself, but of its *preventives*, and will prove a valuable lesson to us, worth all the theories and hypotheses of visionary dreamers from the time of Paracelsus to the present day. A careful inquiry into the facts will I trust, satisfy all fair minds that the common sense of mankind has not been mistaken in attributing the prevalence of this disease to the causes mentioned, not only here but abroad. The record presented in the Chart, ought, I humbly conceive, convince all. The Sanitary Map of the city will show the influence of these localising conditions. No city that we are acquainted with but has these infected spots. The main peculiarities which distinguish them, are filth of every kind, moisture, stagnant air, heat, and a crowded population, aided by the

And as much of that of epidemic yellow fever as any other.

Because we can trace its origin and the causes producing it.

accessory circumstances of intemperance and bad habits. They are usually situated in those parts of cities where filth is most apt to accumulate. In Northern cities, with a declivity to the river, or part about the wharves, as in the neighborhood of "Fort Hill," as it is called, in Boston, has been its hot-bed there from time immemorial; so about the "slips" and wharves and docks in New York, Philadelphia and Baltimore, where are the egresses of their filthy sewers—the concentration of all the polluting detritus of these cities. And so of the "infected districts in Norfolk, which is confined to a space of two or three hundred yards, and mostly made ground." And so of the most parts of Charleston and Savannah. In New Orleans it is not limited, as it is in them, to these localities. It, however, exists here on the river bank, because at this season (August and September) the river is low and the bank exposed, leaving an extensive surface—the common receptacle of all kinds of filth—and here, or not far distant, we find the large amount of unacclimated population; but it first breaks out and spreads in St. Thomas and Madison streets, St. Mary street, about the Markets, at the triangle, Gormley's Basin, &c. &c., (see map, as before mentioned)—*all filthy, crowded and badly ventilated localities.* These are plague spots—they exist in all cities that are badly policed—the sores first fester and mature here, and the bad air or virus is generated and multiplied as the season advances—extends to the neighborhood, and if it meet with a congenial atmosphere, throughout the city—and from an endemic of a locality, it becomes, with concurring causes, a wide spread epidemic. If otherwise, if a more dry or less impure air is met with—if more attention has been paid to sanitary measures—it is more limited, and its progress can sometimes be measured as to its surface, extent and even height, day by day. Such has been the result of experience in New York, and measurably in Philadelphia, and the "infected district" can be and has been "fenced out," and its gradual extension actually calculated as so many feet per day. This cannot be

Seats of these causes in all large cities.

Why limited.

And how extended.

shown here for two reasons: 1st, because these conditions themselves are always more or less combined and extensive; and 2d, the presence of an unacclimated population would prevent its being so clearly shown. It exists in the air—it is the consequence of the causes mentioned—it is the poisoned, infected atmosphere, and not individual—not contagion. A person taking it in the infected spot, and going into a pure atmosphere, has never been known to extend it. If it is taken to a congenial atmosphere, it contributes to its further extension. In this city and in the country during the last year, there existed an epidemic influence (as formerly explained); the congenial atmosphere was nearly everywhere, more or less aggravated by localising circumstances, and the disease spread extensively, and more particularly where those localising conditions existed in excess, (as above mentioned.) This was the case, too, at Algiers, where the disease has not extensively prevailed many years, (although only across the river), produced by extensive disturbance of the soil, for rail-road purposes, and followed by a large mortality throughout the village. These localising conditions existed, probably, *everywhere.* Many of them have been mentioned in a former page. For the sake of the verity of history, and for the inestimable value they promise for the future, a full and scrutinizing investigation should extend over the entire region that was reached by this disastrous epidemic, that *all* the facts be collected and recorded, and promptly, too, before oblivious memories and fabulous statements shall bring to doubt the real features, and the authentic history of this remarkable year be lost, and we realize, in after times, as opposite and parallel to most those in Carpenter's work on the yellow fever of this country—mostly made up of a tissue of statements, both at home and abroad—that have been exposed and refuted over and over again—many of which are personally known to me to be without any real foundation, of which I had made record at the time of their occurrence. It has been also proved from the embarrassment the Commis-

Statements to be of future value should be made up at once.

sion has met with in eviscerating the real facts, even from the more recent transactions of last summer.

Nor is the rocky post of Gibraltar an exception to the requirement of a localising condition from filth, &c., for the production of yellow fever. Although it has the appearance of great cleanliness without, as all military stations have, yet within, the houses are admitted to be, and are notorious for their filth, crowdedness, and want of ventilation, and even the disturbance of the earth in the vicinity, has been noticed to have had a most injurious influence on the public health. "Two successive epidemics of yellow fever, namely those of 1804 and 1813, broke out in the same spot, the dirtiest in Gibraltar, Boyd's buildings, and the epidemic of 1814 broke out at Cavellero's buildings, a place which competed with Boyd's in its state of filth and pollution." "Whenever," says Mr. Armil, "the epidemic breaks out in Gibraltar, it has always commenced in the filthiest spot and this was the case in the late visitation." The same facts have been demonstrated by the best authority, to exist at Barbadoes, Jamaica, and other parts of the West Indies, at Demarara, &c.

Gibraltar very filthy within the houses, and crowded.

The city of Havana is situated on a closed bay of six or eight miles in circumference, land-locked on every side with lofty hills, with the exception of one narrow outlet to the sea, at the North, with marshes about the estuaries of the several small streams that empty into it, bringing the organic detritus of the surrounding country, mixing its fresh with the salt water of the ocean, occupying near two-thirds of the marginal circumference of the bay. This bay receives all the filth of a city containing near two hundred thousand inhabitants—is in many places very shallow, exposing, at low tide, (the tide here being three to four feet) extensive surface, with all kinds of putrefiable materials, to the sun. The water of the bay is often very offensive. All vessels pump their bilge water into it. It cannot be changed; it is so full of decomposing materials that the British naval service has a standing order not to use the water for any purpose on board their ships of war. From experiments made with it, it putrefies

Bay of Havana.

Causes

Of the insalubrity of the city.

on standing a *single* day, while sea water taken at a distance of fifty leagues from land, requires *three* days. The streets of the city proper are very narrow, (about twelve feet wide,) and very badly ventilated, from being irregular, and very crooked, and there is a high wall still further obstructing it. The habits of the mass of the people are of the very worst description, and from the high price of food of every kind, (from the heavy tariff imposition of a despotic government,) the mode of living is wretched in the extreme. That yellow fever should exist here every year, is not at all astonishing, with a high temperature and great moisture. It has even been contemplated to make another avenue to the sea, so as to produce a current and occasional change of water in the bay, which would prove a most salutary measure.

Description of Vera Cruz.

Vera Cruz, although built upon a sandy plain, is but a few feet above the level of the sea. The wells are from six to eight feet deep. There are extensive swamps and low grounds around it, emptying their sluggish currents into the sea, under its very walls; impairing its qualities so much, that, together with the filth of the city, which is emptied into it, it is in the same condition as that noticed above in the bay of Havana, and during the rainy season (the sickly season) ponds are formed in other directions outside the walls. These are about fifteen feet high, and materially obstruct the ventilation of the city, and have been found to be so injurious to the public health, that I deemed it an act of duty to solicit its removal to windward or seaward, so as to permit perflation from that quarter during the summer season (of 1847.)

Cause of its unhealthiness.

The habits of the lower orders are extremely filthy, and the public quarters and forts, when taken possession of by the American army, could not be exceeded in filth. That this should be a chosen seat for the yellow fever is not at all astonishing. I possess the official records to show its influence on the denizens, and on the Mexican army for a number of years, which I will state in another page when I come to show the influence of sanitary measures on sickly cities.—

Let it suffice now to say that it has fully earned the reputation of being one of the most sickly cities in the yellow fever region.*

I state, then, as a universal fact, with the *exceptio probat regulam*, that filth of every kind, with heat and moisture, with sufficient duration, produces yellow fever. The records upon the subject are so affluent, they absolutely so crowd the historiesof the disease, that it is really embarrassing to select from them, and many volumes would not suffice to trace and embody them.

Cause of yellow fever.

Finally, and to leave not a doubt upon the subject, if we can produce instances of the presence of yellow fever, where there has been *no possible intercourse or communication from abroad*, or from any *extraneous sources* whatever, as far as human scrutiny could ascertain, should not the most skeptical yield up their doubts, provided we can satisfactorily ascertain and point out the existence of the causes and conditions I have alledged. It is through such demonstration that we reach and develop the important and impressive truth, that in the concentrated filth which localises it within the geographical limits of its range, (though it has been sometimes assumed to have had a foreign origin,) we present

* The causes productive of yellow fever, are so thoroughly understood by all those who have practiced much, and long, in tropical regions, it is so well defined and so accurately known, that even a prescription is furnished by them, for its sure and rapid production, it is as follows:

"Take, of soldiers newly arrived in the West Indies, any number; place them in barracks in a low wet situation, or in the mouth of a gully, over the brink of a dry river, or on the summit of a mountain, and to leeward of a swamp, or of uncleared ground, and where there is no water, or only bad water; give them, each, twenty-two inches of wall in their barrack rooms; let their barracks be built of boards, or lath andplaster, and have neither galleries nor jalousied windows, but close window shutters, and a hole or cellar under the flooring for containing mud or stagnant water, and holes inthe roof for the admission of rain, the windows only fourteen inches from the floor, so that they may be obliged to sleep in the draught of air: let them have drill every morning on wet ground, and when fasting; guard mounting and all kinds of fatigue not in the morning or evening, but during the hottest time of the day; when on sentry, no shade to keep off the direct rays of the sun; bad bread, putrid meat, few vegetables, plenty of new rum, especially in the morning: discipline enforced by terror and punishment, not by reward and promotion; an hospital similar to the barrack room, without offices, always crowded, plentifully supplied with rum, scantily with water; a firm belief in the doctrine of contagion, and a horror of approaching any person affected with yellow fever. Let these directions be attended to in Trinidad, or even in Barbadoes, [and he might have added New Orleans,] and especially when the air is stagnant, or charged with noxious vapors, subsequently to long droughts, the soldiers will soon die, some of them with yellow fever, some of them with black vomit, and those first in the rooms where these directions have been *most faithfully observed*."

Prescription to produce yellow fever!

This recipe is eminently applicable to New Orleans, and will ever produce the results, as long as it is so "*faithfully followed*."

the *spontaneous cases*, where nothing of this kind *was possible*, where the only agents known to be present, were a combination of filth or decomposable materials, or disturbance of soil, (their equivalents,) with the meteorological conditions; an epidemic atmosphere! It is precisely here, then, where it was impossible to arise from any other source. The cases presented by Dr. Benedict, of this city, as occurring in a secluded spot in the interior of the country, about a mile and a quarter back of *Hollywood*, are exactly of this character. This intelligent and observing physician, with no theories to support, but with a fine talent for scrutinizing observation, here accidentally pitches upon no less than seven unequivocally *spontaneous cases*, and after the most diligent inquiry, finds that it was *impossible* they could have arisen from any imported or extraneous source; and here he discovers every condition that he afterwards learned that I deemed important for the spontaneous occurrence of epidemic yellow fever, viz: disturbance of soil, unusual humidity, (great rains and heavy destructive mildew,) elevated temperature, great radiation, (that is, great and distressing difference between temperatures of sun and shade,) and cold nights, ultimately*. These are valuable proofs of my position, conclusive to science, and valuable to humanity.

Great value of the spontaneous cases.

Settles the subject.

At Hollywood.

Hardly less valuable and corroborative, were the cases occurring at *Gainesville*. Here the cases were clearly *spontaneous*, without any possible origin, (either personal or through goods,) but from the soil, as mentioned in another page, high temperature, intense radiation, epidemic atmosphere, fruit rotting extensively and prematurely, native cows dying without obvious cause.†

At Gainesville.

Dr. Kittridge, the respectable member of the Legislature from *Washington*, states to me, unequivocally, that when the yellow fever first occurred on his plantation, there was not another case of it within fifty miles, and that it arose soon after his extensive yard was spread entirely over (in order

Do. in Washington.

* See his interesting paper. † See Mr. Fulsom's report.

to raise and level it,) with fresh earth from the neighborhood. (This was mentioned in a preceding page, for another purpose.)

The case of Mrs. Selby, the wife of Judge Selby, of *Lake Providence*, breaking out in a remote part of the town, without possible intercourse with any one. At Lake Providence.

At Trenton, it originated spontaneously, from the causes mentioned; several families struck with it at the same time, in different parts of the village. Trenton.

In the town of *Franklin*, in this State, the disease both spontaneously originated and terminated in it, with no sufficient evidence of its importation, and no local cause assigned for its origin. In Franklin.

The case of the "*Black Warrior*," in *Mobile Bay*, affords another striking instance of its spontaneous occurrence, in an epidemic atmosphere.* The first *Mobile cases* clearly appear to have originated in the neighborhood, where there had been considerable excavations for railroad purposes, and the spreading of it to fill up low lots. (For details I refer to Dr. Levert's valuable paper.) Black Warrior. At Mobile.

The eruption of the fever at *Selma*, was clearly due to the same cause, and is in precise parallel with the earlier cases at Mobile; excavations—cutting down embankments and spreading the fresh earth on the streets and low lots exposed to the intensity of a scorching midsummer's sun. Dr. Mabry, in his interesting paper, clearly and unquestionably shows that the fever originated from these causes. Selma.

"At *Demopolis*, Ala., same *spontaneous cases occurred*, being insulated and at a distance, and having no intercourse whatever with the case of fever existing;" "nor were the nurses more liable than other people." † Demopolis.

At *Saluria*, Texas, spontaneous cases occurred, without even the suspicion of communicated infection. ‡ Saluria.

A *Port Gibson*, the same thing occurred, where no possible communication with the sick could have occurred. § Port Gibson.

* Dr Benedict. † Drs. Ruffin and Ashe. ‡ J. H. Brown. § Dr. Wharton.

Baton Rouge. "At *Baton Rouge*, a number of cases occurred without intercourse, or suspicion of it, with other cases, on the river bank under the bluff." *

Centreville. At *Centreville*, La., the first case spontaneously occurred in a mulatto, sleeping near an extensive rotting bank of chips, &c. Wind blew steadily over this bank on the village, and the disease progressed. †

Natchitoches. At *Natchitoches*, the two first cases evidently spontaneous. ‡

Washington. At *Washington*, La., the three first cases had not been exposed to yellow fever. §

Martinique. In *Martinique*, W. I., "yellow fever always developed spontaneously." ‖

Bermuda. In *Bermuda*, the spontaneous occurrence from local causes was equally satisfactory: an old hulk, that was very offensive. ¶

Barbadoes. From direct information, which the Commission has received from *Barbadoes*, the first case clearly originated in a native, having a pretty stagnant gutter at his door, from decomposed animal matter from a slaughter-house and a piggery in his yard; he died of black vomit." In fifteen days the disease broke out near a crowded church yard in a low situation—here four died in one house—it was confined to this locality for some time, but finally spread over the island." The majority attacked were natives. **

Rio Janeiro. At *Rio Janeiro*, the yellow fever "broke out in a particularly offensive spot—low, crowded, ill ventilated lodging houses;" abundant sources for it in low, flat grounds, in filthy, ill drained streets, frequently turned up to dry, the neglected receptacles of all kinds of impurities, *in conjunction with atmospheric changes*."

Local spontaneous origin from filth, &c. "The city is situated on a bay, nearly land-locked, with little tide—sandy and occasionally clayey soil, night soil thrown every night into the bay, and becomes very offensive from the flux and reflux of the tide." The first cases were clearly of *spontaneous and local* origin—the first, in one of the above described boarding-houses, a Danish sailor, direct from Finland, and the second belonging to a vessel that had come from Bahia, which

* Geo. A. Pike and Judge Carrigan. † Dr W. B Wood. ‡ Dr. Crocheron. § Dr. T. A Cooke. ‖ From a communication from Dr. Amic, Doctor-in-Chief, to the Sanitary Commission. ¶ From printed testimony from Bermuda ** Dr. Sinclair.

at the time was healthy, and no others of the crew fell sick, and the next ten or fifteen cases were all from this filthy neighborhood."*

But there are other evidences of its spontaneous origin here, no less satisfactory. "Several masters of vessels, without being questioned, declared that they entered the harbor with the fever on board, although coming direct from Europe; that as soon as they approached the coast and came within the influence of the breezes from shore, their men fell sick with fever."† And several vessels are mentioned whose crews took the disease soon after arriving in port, without intercourse with the shore.

Spontaneous occurrence at sea.

Do. on arrival in port.

"Many persons in the country around Rio, caught the fever, though they had no communication, direct or indirect, with the sick,‡ being evidently—as in the case of the shipping—within the influence of the epidemic atmosphere. While those farthest off were not so influenced, and the disease carried among them, did not extend."

"It is a curious circumstance, and may perhaps tend to elucidate the origin of yellow fever in Brazil, without having recourse to a specific source of infection; that for the few years previous the fevers of the country, evidently not infectious, but of high temperature or marsh origin, have clearly been changing their characters. The genuine remittent has been but little seen for the last three years. In 1847, '48, and '49, it was replaced by a fever of its own class, popularly known by the name of polka, but, in reality, a remittent, and during the present year (1850) it has been replaced by the yellow fever—a disease, also with similar features.§

Change of type appear from change of climate.

Nearly every one of the Inspectors General of Hospitals, of England, in the West Indies, admit yellow fever to be of *local origin;* and Dr. Rush most feelingly and eloquently recounts and laments the different opinion, he, at an early period entertained of its contagiousness, and died firm in the conviction of its domestic origin.

Opinions of Inspectors General of Hospitals.

* Dr. Pennell. † Dr. Pennell. ‡ Ditto. § Do., and report to Sanitary Commission, by Dr. Pennell, through U. S. Consul, R.G. Scott, Esq.)

The spontaneous occurrence of this disease in ships from Northern climates, as soon as they have reached a tropical latitude, having foul holds, are numerous and entirely reliable. Holds of ships are worse than cellars, (proverbially unhealthy as these are, when damp and filthy,) for they have the deleterious addition of bilge water, in slight motion, with refuse of every kind, concentrated in an elevated temperature of stagnant air, my colleague, Dr. Axson, shows it to have occurred in the ships; illustrates the same fact: that this fever pursues or breaks out in such ships at sea, and in port, that it is often confined to them, and that it is only finally gotten rid of by the most thorough cleansing. The ample records furnished by Dr. La Roche, in his interesting article on yellow fever, in the April No. for 1853, of the Amer. Med. Journal, and in the second Report on quarantine and yellow fever, presented to the British Parliament, in 1852, furnish the amplest attestation of the *local origin and local cause*; they all concur to prove, without the shadow of a dissent (both the land and sea causes) that filth and fresh earth, (the principle evolved being probably the same,) with atmospheric conditions, has produced, and by sequitun, will produce yellow fever—that *it originates it, and that the cause, of yellow fever is known.* And I know of no rule of philosophy where we have produced an effect and with a sufficient cause for it, that compels us to look beyond it. This is most happily in strict accordance with the principles that run through the whole system of causation in other diseases—(and why should yellow fever be an exception?) the stronger the cause, the stronger the effect, under the same circumstances. That a fever of the highest grade of malignity known in this hemisphere, should proceed from the greatest concentration of influences known to be injurious to our race, that in a minor degree produces the prevalence of diseases of the same class, of a lesser grade, has been shown in a preceding page. As yellow fever is at the head of its class in the Western Hemisphere, so plague *arising under analogous conditions*, is at the head of its class in the Eastern Hemisphere, and as plague for a long series of

In ships at sea from Northern ports.

Cause of yellow fever known.

centuries *has been shown to be under the control of sanitary measures*, (and would be now, but for the *fatalism* of the Turk, that makes no improvement, and is wrapped up in his contented ignorance and *statu quo*,) so, yellow fever can be controled by the same sanitary measures; and this is really the only valuable part of the subject. It lays down the important foundation of *prevention*, it erects there a stately structure, on which should be emblazoned in lasting letters of living light, SANITARY REFORM, and let us look to it, with the same sacred duty we owe to our stricken city, as we do to those monuments that remind us of the birth of our political rights and national independence. And if we cannot prevent it—if an Almighty Providence, in his wisdom, has cursed us *beyond all the other nations of the earth*, and we have no remedy after FULL TRIAL, let us hug our chains, as the condemned, and, like the bigoted Turk, display our philosophy, and bear it!

And is controlable.

The foregoing views so fully corroborate the highly important "conclusions" of the General Board of Health of England—drawn from the most reliable living authority,* and are so fully explained by the principles applicable thereto, contained in these pages, that I cannot avoid inserting them here.

Conclusions of the General Board of Health relative to yellow fever.

Conclusions of General Board of Health of England on yellow fever.

"1. That yellow fever epidemics break out simultaneously in different and distant towns, and in different and distant parts of the same town, often under circumstances in which communication with infected persons is *impossible.*

"2. That yellow fever epidemics are usually preceded by the occurrence of individual or sporadic cases of the disease, which sporadic cases are likewise common in seasons when no epidemic prevails.

"3. That yellow fever epidemics, though occasionally extending over large tracts of country, are more frequently limited as to the space over which they spread, often not involving the

* Kindly sent me by a member of it—Mr. Chadwick—through our minister in London, Mr. Buchanan.

whole of a town, and sometimes not even any considerable district of it.

"4. That yellow fever epidemics do not spread from district to district by any rule of gradual progression, but often ravages certain localities, while they spare entirely, or visit very lightly, others in the immediate neighborhood, with which the inhabitants are in constant inter-communication.

"5. That yellow fever epidemics, when they invade a district, do not spread from the houses first infected to the next, and thence to the adjoining, and thus extend as from a centre; but, on the contrary, are often confined to particular houses in a street, to particular houses on one side of a street, to particular rooms in the same house, and often even to particular rooms in the same story.

"6. That in general, when yellow fever breaks out in a family, only one or two individuals are attacked; commonly the attendants on the sick escape; and when several members of a family are successively attacked, or the attendants on the sick suffer, either the epidemic was general in the locality, or the individuals attacked had gone into an infected district.

"7. That when yellow fever is prevalent in a locality, the most rigid seclusion in that locality affords no protection from the disease

"8. That on the other hand, so great is the success attending the removal from an infected locality, and the dispersion of the sick in a healthy district, that by this measure alone the further progress of an epidemic is often arrested at once.

"9. That such dispersion of the sick is followed by no transmission of the disease, not even when the sick are placed in the wards of a hospital among patients laboring under other maladies.

"10. That no one of the preceding facts can be reconciled with any other conclusion than that, whatever may be the exciting cause of yellow fever, it is local and endemic in its origin; and the evidence of this conclusion are therefore cumulative.

"11. That the conditions which influence the localization of yellow fever are known—definite, and to a great extent, removable; and are substantially the same as the localising causes of cholera, and of all other epidemic diseases.

"12. That, as in the case of all other epidemic diseases, in proportion as these localising causes are removed or diminished, yellow fever ceases to appear, or recurs at more distant intervals, and in milder forms.

"13. That consequently the means of protection from yellow fever are not quarantine restrictions and sanitary cordons, but SANITARY WORKS AND OPERATIONS, having for their object the removal and prevention of the several localising conditions, and where such permanent works are impracticable, the temporary removal, as far as may be possible, of the population from the infected localities."

Now skepticism must yield up its doubts, and even sophistry can no longer contest the demonstrated truth. A certain combination of conditions, in certain localities produce in thousands of instances, yellow fever. There are rare exceptions to it, these conditions are known—*they are the same in all.* The effect is the same, and the instances are innumerable—the attestators are intelligent and perfectly reliable. There is no assignable motive why they should testify falsely, and it is all in accordance with the common sense and common experience of mankind. Can any thing, short of mathematical demonstration, make it stronger? Could it properly be attributed to the sole agency of the above means in a *single unequivocal instance*, it would be no longer expedient to look to contagion or importation for additional agency; yet we have unnumbered thousands to prove our position. One cause, which is equal to an effect, is always sufficient to account for it. If another be associated with it, which neither increases nor decreases the effect, I do not know by what rule of logic it can be supposed to be instrumental in the production of it. All other views are subsidiary to this, the *true practical value;*—for, if the public mind is *satisfied that the cause is known, the remedy is palpable enough.* It will be no longer

No room for skepticism.

Demonstration.

Its vast practical value.

a question of dollars and cents, it will no longer be a question of the inconvenience of a part of the citizens leaving the city for a few months; it is vastly more. It is a question of life and death, between the hecatomb of victims offered up to ignorance and neglect, and the enjoyment of health and the comforts of life at home. It is between New Orleans as a mere factorage, for she is nothing more, with this constant liability, and New Orleans in the full exuberance of salubrity, unequaled in her climate, with fine promenades, public gardens and parks, with railroads connecting her on one side with the Atlantic cities and the old world, the cradle of the human race, the favored haunts of science and civilization; on another with the granary of the world, and on the West, on the sun sitting on the golden regions of California. Her name will no longer be a theme for aversion and alarm; she will no longer be the "plague city"—the "sepulchral city." It will then be a pride and boast to hail from New Orleans. Surely this is worth striving for, and we shall prove that all this is within our power, that it only requires us to put our shoulders firmly to the wheel, and that you are bound by every principle to own the impulse which duty prompts, and a sense of self-preservation and a just pride aids us in carrying out. These, then, are the promised fruits of this commission, and should they be realized, no small honor in coming time, will redound to him who originated the plan, and the council which adopted and put it in execution.

The importance of knowing the cause of a disease,

The practical importance of knowing the cause of a disease consists in the *means it directs us to use in the way both of prevention and treatment*, and it is for that reason that we have dwelt so long upon it. It is thus also, in the forcible language of Mr. Chadwick, "getting at the antecedents, and mounting to the sources," we reach too, the origin of orphanage and widowhood, of intemperance, and above all, the fountain of the greatest mass of moral evils; and it is *here* that our remedies become ultimately the most radical, effective and praiseworthy.

Prevention is better than cure. It is infinitely less costly, and more easily accomplished. Ten or twenty thousand dollars, judiciously disbursed, may prevent the occurrence of a fever, or an epidemic, that millions cannot cure or pay for, in the loss of life, character, business, &c. For the sake of convenience, and for the purpose of facilitating investigation, aiding the memory, and grouping those diseases proceeding from congenerous causes, statists have classed them into certain divisions, such as have been presented in our record.* The class zymotic embraces those which, in the main, distinguish one country from another in a sanitary point of view, such as epidemic, endemic, &c., (fevers, intestinal diseases, &c.) where this class is large, as it is in this city, being five times greater than it is in Northern cities, the place is esteemed sickly, and when small, the reverse. This class is in a great measure *under the influence of sanitary regulations*, and called "preventable," because they *can be prevented*, and the attention paid to and the efforts, made in their prevention is also a test of high civilization, and the estimate that people entertain of the value of human health and life. The mortality that is *unpreventable* is, in most countries, a constant quantity. In England it is estimated at between ten and eleven per thousand of the whole mortality.

Prevention better than cure

The great value of knowing the cause of disease (and the fatal consequences of a mistake) so far as to be enabled to prevent them, is so forcibly set forth by that eminent man, John Hunter, (on the diseases of Jamaica,) that I quote them: "In military physic, the great improvements to be made are not so much in the *cure* as in the *prevention* of diseases, which depends altogether on a knowledge of their cause. If diseases arise from the air, contaminated from the foul ground of a camp, or the exhalations of a marsh, it can only be avoided by a change of situation, or by taking care not to come within the sphere of activity of such noxious causes. Let it be supposed for a moment that a mistake should be

Fatal consequences of a mistake.

* Table F.

made, and that the camp or remittent fever be not considered as proceeding from their proper causes, but believed to depend upon *contagion*. It is evident that complete destruction to all must be the consequence of such an error, and in medical history there is reason to fear more examples than one of this might be produced!" How singularly, and how prophetically has this great man portrayed the condition of things in New Orleans! and how truly he says that "destruction" must ensue from such an "error." If full faith is put in the "importation of the disease" as necessary for its prevalence," and "contagion should mark its footsteps," our city would indeed, be likened to our State emblem! and like the pelican *foster in our bosom the poison that is sucking our vitals*, then may we bid adieu to all *sanitary measures*, and to any hope of our amelioration and advancement!

This entire subject is so vast and so important; the materials are so abundantly developed by the humane investigations of the English Government, and kindly distributed, and much of it is so applicable to our situation, notwithstanding the difference of climate, that the temptation to quote far exceeds the limits allowable to this report. In the report "on the experience in diseases, and comparative rates of mortality," by Mr. Lee, it is abundantly shown by all that has been said of the destructive ravages of fever in small towns, and even in *villages*, in various parts of the country, "that diseases of the class termed preventable, are not inherent in, essential or peculiar to places of dense population." That the remedy is, that "the air is to be purified by *immediate removal before decomposition*, of all organic matter, and other refuse capable of producing malaria, and town visitation will be as little required, irrespective of forms of streets, courts, &c., and the density of buildings," and his deductions are that he can find no valid reason why towns *should be more unhealthy than the most salubrious spot in the country!*" That "one-half of all the existing disease and mortality is in excess, and preventable!" That "excessive mortality ought to be prevented by

Disease not essential to dense population.

means compulsory on all parties, without exception. And he comes to the conclusion that all the causes point to *localised filth, accompanied with moisture,* as the great cause of disease and death" in that latitude. Had those conditions existed here, with our high temperature, *yellow fever* would have been the certain result. He goes on farther to state, as a conviction from his inquiries, that the great mass of the people lose nearly half the natural period of their lives by such exposures; and he came to the conclusion, after examining a large number of towns, that "the *inevitable* mortality of the kingdom is not greater than ten to one thousand per annum, while in some it rises as high as sixty-nine or more. And the remarkable fact was elicited from the inquiry, that let the district be ever so unhealthy, or ever so salubrious, the *inevitable mortality is nearly a constant quantity.* He goes on farther to say that typhus, the great preëminent scourge of the country, is essentially independent of, and unconnected with geopraphical position, climate, physical contour, geological strata, or other uncontrolable circumstances. That there is no *intrinsic* connection between density of population and a high rate of mortality, and the avocations of the people: that where neither surplus water nor organic filth is removed by drainage, there the greatest destruction takes place, without reference to any other consideration, and that the ratio of mortality is directly proportional to the badness of the drainage."

Localised filth the cause of all disease.

Typhus independent of climate.

All depends upon removing filth and moisture.

He farther states, in his conclusions, that, "although the poor are the chief sufferers, yet no class of society escapes the pecuniary consequences of preventable disease—that the use of narcotics and habits of drunkenness, are, in numerous instances, developed and increased by defective sanitary arrangements, and that, in twenty-nine places visited, the pecuniary loss on *one years' excessive sickness,* funerals, and lost labor, is about *equal to the first cost of complete works* for water supply and drainage in the same places." And that THE MOST PERFECT SANITARY ARRANGEMENTS ARE THE LARGEST PECUNIARY ECONOMY, and the cost of *preventable dis-*

The rich suffer as well as the poor.

The cost of preventable diseases equal to the whole public income *eases is equal to the whole public revenue of the country!* He concludes his most valuable paper with a number of suggestions, from which the following will fulfill our present purpose, viz: "*that a penalty should be exacted* on all places where —upon an average of seven years—

1st. The mortality has been greater than 20 to a 1000 of the inhabitants; or

When penalty on the public authorities to be exacted.

3d. Where the proportions of deaths from epidemic, endemic, or contagious diseases has been equal to 1 in 400; or

4th. Where the average of all who have died has not exceeded thirty-five years." How eminently applicable these remarks are to us!

Proportion of preventable mortality.

The amount of "preventable mortality" is more than half of the whole mortality. Last year it was more than five times that amount here. In every epidemic year it is largely increased, of course, and this has been shown to be *pari passu* with the increase of the causes assigned—that is, with the preventable causes.

Origin of disease.

Of cholera.

Poverty, filth, intemperance. wretchedness and crime have a similar paternity. Disease originates from them, and, taking the winds of the morning, it spreads itself to the uttermost parts of the earth. Wherever it finds food it localises itself and becomes developed, and hence, under a certain concentration, the inhabitants of the palace, as of the hovel, become its victims. Hence, all the world is interested in sanitary measures—in eradicating the seeds of disease, and thus make a brotherhood of all mankind. Had not a concentrated malignancy, from filth and bad habits, in a congenial atmosphere, on the banks of the Hoagley, have given a rise to epidemic cholera, the human race might have been saved that afflictive scourge. But why limit it to cholera? The same principle may be applied, with equal justice, to yellow fever, plague, leprosy, the venerial disease—nay, *is there one disease* to which man is subject, that is not the result of the rupture of some one or more *of those great hygienic laws* which the Almighty has laid down for our guidance?

A civilized, refined and humane government is known from the care bestowed on the health, and the value set on the lives of its citizens. In a *Republican* government it should be considered a joint-stock concern, and we should put in practical action the first law of our being—self-preservation. Carelessness in such governments—a neglect of this, its *most* important concern, is as unexpected *a priori* (as they are all joint sovereigns, and unfortunately depend *too much* on what is ignorantly supposed an *individual* concern,) as that those who live by the sickness of others, should be almost the only originators of laws and means to *prevent* sickness! Yet such is the fact. The profession of medicine is the true philanthropism.

Evidence of civilization.

Originators of sanitary laws.

In a society of laws and a Representative Government, where the governed give up a part of their rights and property, too, for the proper preservation of the remainder, it is clear that there is no more sacred deposit in the hands of the representatives of these rights than that of our health. My neighbor may commit such a nuisance as may destroy the health or comfort of my family. The law takes away from me the right to interfere. The power is with the body politic, who represents and with whom is deposited my rights, and as rights and duty are correlative, it becomes the duty of society to interfere and abate it. A flagrant case is put to show how clear the *principle* is. The body politic is bound to abate *nuisances*, however small, or is *responsible for the consequences!* If a bridge across a street or highway is defective and a citizen becomes injured in consequence, the corporate body is amenable.

Legal claim of the civil power to protect health.

By the constitution of our country, no one is allowed to injure or take away the life of another, without being compelled to repair the one through his property and means, and suffer for the other the felon's penalty. It has been demonstrated, that the great mass of the mortality of this city has arisen from *preventable causes*; on whom, then, should fall the merited penalty of this neglect? Our late distinguished countryman, Dr. Rush, with a prescience which often

Original opinion of Dr. Rush.

accompanies true genius, said: "To all natural evils, the author of nature has kindly prepared an antidote. Pestilential fevers furnish no exception to this remark. The means of preventing them, are as much under the power of human reason and industry, as the means of preventing the evils of lightning and common fire. I am so satisfied of the truth of this opinion, that I look forward to the time when our courts of law shall punish cities and villages, for *permitting any* of the sources of malignant fevers to exist within their jurisdiction." The General Board of Health of England, with the Earl of Carlisle (better known in this country as Lord Morpeth,) at its head, says: "The British Parliment has legislated on the conclusions submitted, with an accumulation of demonstrable evidence, that the causes of epidemic, endemic, and contagious diseases, are removable; and that the neglect, on the part of the constituted authorities, to remove such causes, as far as they are obviously within their control, is *a punishable offence!* The foundation which the legislature has thus laid for the physical, and consequently for the moral, improvement of the people, is recognized. Half a century ago, it was said by a great physician and philanthropist, that the time would come, when the legislature would punish communities for neglecting the known means of preserving the public health, and that prediction the British Parliment has been the first to realize." That "philanthropist" was our own great countryman, Dr. Benjamin Rush, of Philadelphia.

First Legislative action upon it.

If, then, we have arrived at this important fact, to what cause *yellow fever is to be ascribed*, if we can no longer plead ignorance, as an excuse for inaction, *we have no further excuse for its continuance among us*, and I do seriously think, that it is as much the duty of the civil authorities, to *keep this city free from yellow fever*, as it is to keep it *exempt from any other controlable calamity!* This is bold ground, and I intend it to be such. I have not come to it hastily; but *that* is not the question; *is it the true ground?* Have the reasons I have adduced, from the investigation the subject has undergone in the preceding pages, been sufficient to convince our people that we have been suffering under *controlable evils?*

As much the duty of city authorities to keep off yellow fever as it is to protect life in any other way.

That is to be the *true ground* before the people now. If I am not greatly deceived then, in this much cherished idea, REFORM is the great watchword applicable to our situation, and no stone should be left unturned to remedy the evils of the past, and arrest the downward march of everything.—Leaving, then, the great principles of philanthropy, of benevolence, of intelligence, nay, even of self-preservation, out of the question,—those which usually move great communities to action,—let us appeal to the mere *pecuniary interests* of the public. That alone, is motive sufficient to move most bodies, as low and sordid as it is. With no position on this continent, if on the globe, equal to it as a mart of commerce; where nature, for that purpose, has done everything, and man nothing, (for health exclusively,) we are permitting every village of yesterday to outstrip us in the race of population, of wealth, of public monuments, of social improvement, and intellectual enjoyment; and last, but what is first in importance, HEALTH, we stand positively lowest in the scale. Every little village, wherever situated, enjoys a salubrity that is our due. This is a painful subject; it is one that is humiliating, nor would I have referred to it so often, were it deemed irremediable. It is not so. If once, when our population was forty-three thousand and thirty-one, (in 1827,) our mortality did not exceed 2.22 per cent.! and in many parts of the country it *does not exceed half this now!* If, in former times, this country enjoyed a salubrity almost primeval, has the soil so changed, the climate become so deleterious; has additional population evolved such a poison, or *have we become* so deteriorated by the golden dreams that most persons entertain on first visiting this country, that no efforts were necessary to acquire it, that it only required to stretch out the hand and gather, and that the primal injunction, "by the sweat of your brow shall you earn your bread," is no longer applicable? If such has heretofore been the prevalent opinion, as it should seem it has, the sad events of 1853 are sufficient to disabuse it. That calamitous visitation

Reform the great question now.

Its sacredness.

A shameful and disgraceful neglect; yet may prove a great blessing.

may yet prove a great blessing to the country, if it shall have brought home to our people the sanitary and salutary lesson, that all the facts we have garnered, the principles we have evolved, and all the hygienic laws and practical results which can be so obviously deduced from them, when once fully adapted and rigidly enforced, will insure to New Orleans an exuberance of health, it has never yet attained, and cause her to rival, in salubrity, the healthiest large cities on the globe!

Certain result if sanitary laws established.

SECTION IX.

RECAPITULATION OF CAUSES AND RESULTS.

Meteorological causes—Special terrene causes—Greater care required in fast growing cities—Can't acclimate to filth—Tracing the progress of the disease by digging—Filth, inundations of the coast and throughout the State. SANITARY MAP *of the city—Application of principles—Location of filth and disease, the same, the one resulting from the other, in each ward, with the ratios to population—"fever nests" "and plague spots,"—the mode of spread of the fever.*

Before proceeding to the application of our *remedies*, it may be best, in order to be thoroughly understood, to make a recapitulation of our positions.

The duty of tracing the *outbreak of this fever*—its *origin* and *transmissibility* has, in the division of duties, devolved upon my colleague Dr. Axson, and most ably and graphically has he performed the task; clearly demonstrating, that it was not from foreign importation that it was derived, but, although connected with foul ships from *European* ports, that it was due to domestic birth and growth, whether at the Levee or elsewhere, and that at its *divers origins*, there was no necessary connection the one with another. Now it becomes my duty, under the resolution in *exposing the sanitary condition of the city*," to show what and where those causes were. They have before been referred to in general, wherever it has been attempted to

Not of foreign importation.

demonstrate their applicability—the influence of such causes in similar and in different climates, their direct bearing upon former epidemics, and on their influence in the rural districts, and I now proceed to show their special influence in the production of the late epidemic.

The causes assigned were two-fold, and these formed the constituents of the epidemic—1st, METEOROLOGICAL, and 2d. TERRENE.

To the 1st. belonged A—a long continued range of tropical temperature preceding the outbreak—the average at midday, of the two preceding months of May and June (instead of being a month later) being nearly 83°, and which continued throughout the epidemic. B.—An unusually high hygrometer, which continued and increased, exhibiting an almost saturated atmosphere. C.—Heavy rains. D.—unusually high and distressing radiation. And E.—An unprecedented intensity and continuance of stagnant air. The unusually early establishment of this tropicoid condition, in the elevation of winter temperature, to that of spring, and of spring to that of summer, thus anticipating by more than a month, the usual evils of autumn, with an aggravation of the burthens ordinarily incident to it, with the extraordinary combination of those which preceded them, were the main ATMOSPHERICAL ELEMENTS which composed it. These are stated in detail in the tables and for the three epidemic months—four or five times daily.

Meteorological or climatic causes

2d. The TERRENE CONDITION was composed—A.—of the upturning and exposure of the original soil, in the cleaning out the canals Claiborne, Carondelet, Marigney, &c. The immense exposure in making a new basin on Bayou St. John; digging on St. Paul street to Bayou St. John; digging ditches and clearing between Conti and Common streets, making a new levee and ditch on Lake Pontchartrain, the digging and embankments on the Northern, and Jackson street railroads, and extending up within half a mile of Carrollton—approaching the river and extending near twenty miles in the rear of the plantations—in the centre of the city, the exposure of the subsoil for *water*

Special terrene causes.

Earth exposure.

pipes in Bourbon street, near the Water Works (where some of *the first cases occurred*) New Levee and Post 84, and other parts, to the extent of about a mile, and for *gas* probably as much, and principally in Apollo and to Nayades and Dryades, in Galvez and Perdido streets, and* repaving Annunciation, Royal and Chartres streets.

B.—Extensive digging and embankments of earth at Algiers, opposite the city—being almost eighteen inches high, and eighteen feet wide, ascending the coast for about twenty miles, running from half mile to a mile from the river, in the immediate rear of the plantations.

C.—The exposure of the naked bank of the river for about six miles, many parts of it made a common receptacle of, and reeking with garbage and filth of all kinds, exposed to the sun and rain, without a single police officer, to prevent its being made a common deposit for these nuisances, or covering or throwing them into the river, besides the fermenting drainage of sugar and molasses hogsheads on the Levee.

Streets.

D.—The filthiness of the streets, privies and back yards, a matter of common observation by the public, and complaint in the newspapers, the gutters often twelve hours after a rain, which had washed them clear, bubbling up with a gas through dirty water.

Unfilled lots.

E.—The large number of unfilled empty lots and unpaved streets, in various parts of the city, and particularly in the Fourth District, which was much the most severely scourged with the fever in proportion to its population—these low lots being a receptacle for, and exposing filth of all kinds and stagnant putrid water.

Open drains.

F.—The large open drains in and near the city, including the large ones in rear of the First and Second Districts, and Gormley's Basin half filled with the refuse of its district.

G.—The nuisances of soap and tallow chandleries and the

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* The extent of the excavations for these purposes in successive years, I have in vain sought for. In 1837, I have been informed the yellow fever was very fatal to those employed.

large collection of manure near the vacheries of the Fourth District. Manufactories.

H.—The interments *within* the city of six cemeteries, the receptacle of 7,063 bodies during last year, to lend their important aid in corrupting the air. Interments.

I.—The numerous *slaughter-houses* in the Fourth District, and the many large *vacheries* and livery stables, with their offensive and polluting exhalations Slaughter-houses, &c.

K.—The crowded, filthy and unventilated dwellings, in low, damp situations, many in half-drained and unpaved lots and courts, with filthy, stagnant water under the floors. Damp, crowded and filthy houses.

L.—And about sixty thousand of unacclimated population which has been added to the city since the last severe epidemic of 1847, and we have aggregated together materials to produce an epidemic, and the food to support it unprecedented in this country.

No man who is acquainted with these circumstances should be at all surprised at the disastrous results which followed; there was no difficulty in predicting it *a priori;* but our great misfortune here is that the people are ignorant and *kept ignorant* of the condition of things. Delusive assurances are constantly dinned into our ears of the "cleanliness and salubrity of the city," which after a while, deceives even the more intelligent, and produces carelessness and quietude of the public mind, when the most ceaseless vigilance is urgently called for, from our position, and *no official Board has existed for years, whose special business it should have been to attend to this important concern!* The large addition to our population is not properly estimated, nor its results, and some explanation is necessary. A population of exotics, unacquainted with the requirements of hot climates, huddled together, in close, damp, unventilated apartments, with filth, poverty and intemperance, furnish materials in every climate for epidemics. In more rigorous regions, of typhus; in the hotter climates of every class of *fevers*, from the mildest to the most malignant. In cities of rapid growth, there is always a tendency to an Public kept in ignorance. In fast growing cities a large proportion of immigrants.

excess of this kind of population, where the people increase faster than the city itself, buildings of an appropriate kind are not found; hence the diligence and the surveillance that is required on the part of the civil authorities to extend that species of guardianship over these materials of its labor as well as of its wealth, and future growth and prosperity, which they are usually ignorant of. The more dense the population, that is, the nearer men and habitations approach each other, the more curtailed the term of life, especially, in a hot climate. Filth accumulates where there are no pavements, as in many parts of our city, where was the greatest mortality last season. The poisonous matter sinks into the soil, a dangerous compost is formed, which, from the closeness of the habitations, ventilation does not and cannot remove. During rainy seasons, (the season of heat and fever,) its tendency is to spread, and when the temperature becomes favorable by elevation, disease results. That this is not always the case when they are apparently favorable to its production, only shows that these require time for their peculiar combination and physiological susceptibility to develop it *although sickness of some kind or other is always present.* The constitution is slowly undermined, and the duration of life materially curtailed. It is then, erroneous to suppose that these rookeries are not injurious to health, because they do not *always* produce *fever and yellow fever.* There is neither necessity nor propriety in denominating this "*want of acclimation.*" The accusation is no less a slander upon the climate than it is upon decency. Filth is offensive to the mass of mankind, instinctively—as injurious to his health and well being. It would be much more so, were it not associated with habits and exposures that tend to harden and invigorate, and thus render the system able to bear what to another, totally unused to it, and more delicately raised, would be early fatal. Man cannot become so acclimated, (or so habituated to it) that it will not affect him; with climatic conditions he can, because God made one, and man the other; it is at war with the elements of his being, it dilapi-

Greatest mortality where no pavements.

Mortality not from want of acclimation.

No acclimation to filth.

dates the very foundation of life. In another page it has been shown that more than sixty per cent. of the *natives of Egypt* at times fall victims to their endemic fever, the plague,*born and brought up in the midst of it,* and in at least two parts of our country, Petersburg and Bristol, no native reached the years of maturity until certain physical conditions, on which they depended, were altered; and the miserable, squalid and unhealthy condition of the crowded and cellar population of all cities, is ample proof of the fact. That man may become acclimated, that is, accustomed to certain atmospheric elements, such is the elastic power of his constitution, is admitted as a fact of universal experience, and is explicable under physiological laws, but to attribute the mortality that has occurred here to his wanting this attribute, arising from these conditions, leaving other things entirely out of the question, *is a poor and baseless excuse for indolence and carelessness,* and a reflection upon the habits of our people—a stain upon the public authorities, and exhibits an ignorance of the climate and of its influence on man.

To what extent acclimatable.

The test of the salubrity of a city or country is hardly to be estimated by its influence on the native population; if so, what is esteemed the most healthy region would be misnamed, for there are but few countries that are not favorable to those born there. Hence it is that *we* denominate the coast of Africa, Batavia, Calcutta, &c., the most fatal to human health and life, (in Rio, *New Orleans* is classed among them!) yet, the natives of these countries respectively, do not so denominate them, and in fact, we know that they enjoy great physical health and vigor. But who ever esteemed a place sickly where *he* lived! it is one of those pardonable weaknesses we can as easily forgive, as account for. Hence then, *the true test of the salubrious condition of a country must be in its friendliness to the stranger—the facility of its being reconciled to the requirements of his constitution,* and not merely to the native—the acclimated—the habituated to all its otherwise noxious impressions, and such is the resiliency of man's constitution,

The true test of the salubrity of a country.

that he can almost become reconciled to anything—*except filth!* —Let me be understood: acclimation literally means, that the constitution can become reconciled to that which forms the climate of a place—that is, its *atmospheric conditions of heat, moisture, &c.* This has nothing to do with what I have elsewhere denominated the "terrene" conditions. Habituation to the things around us is often called "acclimation," and can often be procured by a few months' residence, but it is not *acclimation*, it is only a fixation of habits and a reconcilation to the things about us, the rupture of which is the cause of so much diversified sickness to travelers of all kinds, new soldiers, &c.—in fact, to all who break the habitual course of ordinary life, that regular routine which is so conducive to lengthened existence, and which the system has become so reconciled to as to adopt it as one of the laws of its being.

The meaning of acclimation.

The difficulty here, then, is not that of *acclimation properly considered*, for this can be easily acquired, but it is to those noxious causes (filth &c.,) that are injurious every where (and to which there can be no acclimation), the more so, where heat and moisture are superadded to them. The climate of this place, then, is not lethal *per se*, but by those factitious conditions imposed upon it, which we have the power, and it is our sacred duty, to remove. Hence then, away with the nonsense about the difficulty of acclimation, which only tends to blind the ignorant; if we are to have a healthy city, we must have a *really clean one.* It is the first; it is the second; it is—in the paraphrase of Demosthenes—*the last essential requirement.* However it may be, it formed an aggregation of materials, with the meteorological adjuvants, sufficient to produce yellow fever, in any part of the present and former yellow fever regions, if in the East, a *plague;* it far exceeds the prescription to *produce* yellow fever, mentioned in a note at page 371, which in the opinion and experience of eminent men accustomed to investigate yellow fever for a long series of years, was amply sufficient for its origination.

The real need.

The compound origin, then, is a clear and unequivocal one.

and rests on contingencies, which after a most thorough examination, I am fully convinced, the ability, the science and ingenuity of man *can* counteract. The task, too, is not such a gigantic one. It can be accomplished without difficulty, by public wealth (not much), by public spirit, of which we have plenty for purposes not half so valuable, and more by *public determination.* A hundred-fold more of each has been wasted upon objects, not a thousandth part of the worth of this—nay, whose value sinks into insignificance in comparison. Can any thing be too expensive? Can any object be nobler? Can any earthly blessing compare in magnitude, to restoring salubrity to a wealthy and populous city, and thus putting her in a condition to fulfil her great destiny, *if it succeeds*! But, in order to succeed, it has to be done *completely*—no half-way measures, no temporary expedients; they are failures to the great public now, will again fill this city with mourning, and are disgraceful to the intelligence, and a stain upon the philanthropy of the South.

All remediable.

Before proceeding to the remedies for the disastrous condition we have taken so much trouble to point out in detail, the result of which it was so easy to predict before hand, let us dwell for a moment, on the immediate and direct effect of these agencies, which have to light us through the investigations of the Commission, to show how demonstrably applicable our positions are.

The statement of the amount of disturbances of the original soil, shows that this as *much exceeds that of former years*, as the mortality exceeded that of any other, except from the combined effect of *cholera and yellow fever*, in 1832! That at Algiers it commenced with it, most obviously aggravating, if it did not originate the fever there, (as it did in the city in 1797) causing a large mortality—300 out of 350 hands employed on the railroad, dying of it; that this disturbance extended up the coast, being at a distance from the river from one to one and a half miles; that following up the line of the road, the villages of McDonogh and Gretna successively bore the brunt of its influence; that the unprecedented amount of fevers on

Tracing the progress of the fever from the city, into the country.

plantations, near and in the rear of which these embankments were made, of Mrs. Waggaman's where the sickness was great and the mortality large, of Mr. H. R. W. Hill, where the sickness was unprecedented—nearly every one suffering from it—Mr. Hill himself and another gentleman falling victims to it; that on the Jackson Street Railroad, from the heart of the Fourth District, the mortality was fifty out of the eighty workmen employed, and from the whole of that district probably much greater than from any part of the city; that this effect was added to on the Great Northern Railroad, nearly 50 per cent. of the force employed, having died of it.* That this road extended within half a mile of Carrollton, where the mortality was very great, of this disease, (and I believe, for the first time,) thence some ten or fifteen miles in the rear of the plantations of the Messrs. Kenner and others, where sickness and mortality marked in its track the devastation of this fever; probably the first time the yellow fever was in any of these rural districts on either side of the river. That the probable reason why it was not so destructive in the rear of the Second District of this city in the more immediate neighborhood of the exposure from digging the Carondelet Basin, was that it consisted (with rare exceptions) of an acclimated population, who almost alone were exposed to it, although the sickness with them was very great.

Effect of inundations.

Why rural districts in other States do not suffer so much.

Why fever late in some places.

That the tracing this fever throughout the Southwest, (so far as we have been able to extend our investigations,) there have been similar disturbances of the soil, or other adequate causes of localization; that the *extensive inundations*, to which various parts of the State has been subject for divers years back, has been one of the principal causes of greater infliction on and near our great streams, than in States not thus subject, and consequently, this is the cause *why they have not thus suffered in their rural districts;* that these devastations did not occur at once, but just in proportion, (as seen by the Report from Prof. Blodgett) and as soon as the other condition (the other "blade

* The actual mortality here could not be procured—the sick were usually sent to the city, when taken.

of the shears"—always essential) was present or matured, viz: the occurrence of a sufficient amount of moisture.

In the resumé of our facts, principles and deductions, for the purpose of making the subject more clear, satisfactory and conclusive, I present the—

SANITARY MAP OF THE CITY.

Let us illustrate our principles still more closely, and apply them to the actual condition or our city during the last year, by inviting an examination of the Sanitary Map we have prepared after so much labor*, presenting the *localization of all the cases of yellow fever of the year, in the separate Wards*, together with the main causes which produced them, delineated on the Map, thus furnishing the *argumentum ad hominem*, or practical test of the truth of our principles.

We sat out with certain propositions in relation to the cause of our epidemic and endemic yellow fevers, and gave the facts and reasonings thereon. We have given the record of the experience of other cities and countries, in strict corroboration of our views. From reasoning a *posteriori*, we have stated in advance, by an *a priori application*, that an epidemic disease of the worst form, must occur as a result of existant conditions.† That prediction was most fully verified. I now proceed to a still more practical application, by exhibiting the Map, having marked on it the locations of the various nuisances, to which, theoretically and practically, we refer as the main cause of the epidemic, (and I use the term in an extensive sense, embracing the principal causes offensive to health,) together with the localization of near 23,000 cases of yellow fever, which I have collected from private and public sources, and the presumptive locations of the balance (about 6,000), making in all a total of 29,120 cases.

Application of reasoning.

I desired to construct a Map exhibiting sanitary districts, formed solely of portions of the city having contiguous similar

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* In the construction of this Map, I have received most invaluable aid from Major S. G. Blanchard, of this city. Mr. D'Hemecourt, the Surveyor, and the able Street Commissioner, have also lent me their kind assistance.

† Published Report of the Academy of Sciences, of this city, for the year 1853.

sanitary liabilities. That would have been rather more exact, provided I could have obtained the amount of population in each, so as to show the *comparative influence.* That I found, after full trial, impossible. I then determined to adopt the division by Wards, such as they were when the United States Census was taken, in 1850, as I would then have a standard for ratios—presuming that to furnish the necessary data, and from which I could compute the increase of population, in the three years that had elapsed since 1850. Accordingly, that was adopted as the only possible plan. After completing the collection of the localizations, as far as it was possible, I then proceeded to apply them. Upon scrutinizing the only returns sent here from Washington, in which there was any division by Wards, I found the population of three Wards in the First District enumerated in one aggregate, and the *slave* population left out altogether; and as a most remarkable and unusual number of cases of yellow fever had occurred with that portion of the population (and it is believed) for the first time, and were included in my localizations, it was absolutely necessary to embrace them. To surmount these difficulties, I had to consult all the census returns of the city and State for the last seven years. These I found so utterly discrepant that I had to calculate at last upon a comparison of each, and various probabilities, and make the best approximate estimate of the total population of each Ward the subject was susceptible of, and accordingly present table R, not as the exact population, but believed to be as near it as it was possible to get.

Difficulties in computing the population.

City returns not reliable

Again: in order to avoid making the Map too large, or on so small a scale as to be indistinct, it was necessary to exclude the exhibition of some important agencies, to which great efficiency has been ascribed in the production of the fever, viz: basins and canals that have had their filty detritus exposed to the atmosphere, levee dug and embanked, and the low swamps and open drains of the entire neighborhood.

Map too small.

The number of *cases* of yellow fever occurring in the city during the year are estimated to have amounted to 29,120

Total cases of yellow fever.

Cases from private practice.

At an early period the Sanitary Commission issued a circular, requesting professional gentlemen, and others, to transmit to it a statement of the localities of their yellow fever cases, and all other cases of the zymotic class. A few responded at an early day, in full; most of the others were personally solicited by me. The gentlemen whose names* are mentioned in a note, below, kindly furnished data, which, with those before mentioned, amount to.............................. 7,624

From public sources.

The Howard Association promptly furnished its records, and from it, and several of the members, who attended cases not recorded on their books—what was called "outside cases"—and from the various public institutions, mentioned in another page, was procured the localization of................................ 14,680

From Charity Hospital.

To these is to be added those of the Charity Hospital and some other institutions, which do not record what part of the city the cases come from that they receive, were equally distributed in the different Wards, in the *proportion* these Wards had *already furnished the known cases*—these amount to.................... 3,872

Balance how distributed.

The Sanitary Commission, after a full examination of the list and the localization of the distribution, and of those who had furnished them, that from some portions of the city few physicians had complied with our applications, were of opinion that 2,994, distributed among the four districts, according to these apparent deficiencies, would be a fair equalization. They were accord-

* The following professional gentlemen have kindly responded to my application for the localization of their yellow fever cases, and are entitled to the thanks of the Sanitary Commission therefor, viz: Drs. Benedict, Copes, Henderson, Wood, Poelman, Kovaliski, Axson, Dalton, Rhodes, Davezac, Cantrelle, Seguin, Lemonier, Lindsay, Hart, Stone, Picton, Fenner, Zehender, Cenas, Baldwin, Mather, Sunderland, Batchelder, Smith, Stille, McElvy, Ball, Campbell, Dodson, Adler, Quilling, Bensadon, Wedderstrandt, Kennedy, Jones, Beugnot, Moss, Wetzell, Jaubert, Barbe, Pecquet, &c.

The members of the Howard Association have kindly furnished me their Book of Record, and Messrs. Bouillemet, Whithall, Willis, Robertson, Nimmo, Shaw, Connitie, and various others, have ably supplied me valuable details about localities, "pest houses," the character of the cases in different localities, &c. &c., which, with the aid of my brethren, above, furnish great additional value to the observations and deductions connected with the Sanitary Map.

ingly divided among the several Wards of each District, upon the principles just laid down 2,994

29,120

Explanation of Table R.

Accordingly, I present table R, which presents in its first column the *Districts and Wards*, separately; the second column furnishes the *estimated population;* the third, the cases occurring in *private practice*, as reported to me, and in such public institutions, in which the localities were noted, amounting to 22,304. These, as being more definite, are calculated separately, and their ratios placed in the fourth column. The fifth contains the estimated *unreported*, and upon the principle stated above; the sixth furnishes the *aggregate* of the whole, and the seventh, the *ratios* these bear to the population in the second. The last column furnishes the estimated proportion, *in population only*, the colored bear to the whites in each District, as they are less susceptible of yellow fever than the latter. I wish I could add the proportions of the already acclimated, in each, also, but that was impossible.

It is to be deeply regretted that it is found necessary to form *estimates*, instead of *calculations from precise data.* As the subject was one of vast importance to the community, extraordinary pains and labor were expended to make the results approximate to truth as near as possible. It is believed to do so, and will be obviously useful for most practical purposes.

Sources of information.

In presenting these important details, in procuring the localizations from my professional brethren, and the philanthropic members of the Howard and other Associations—from examining the *localities* of the various nuisances—the "pest houses"—the unpaved, filthy yards, and low lots and squares—(ponds, in the rainy or sickly season)—basins—canals and open drains, and the filthy materials thrown from them—the exposure of fresh earth—the cemeteries—vacheries, livery stables—slaughter-houses and unpaved streets, to which so much evil has been so properly and so justly attributed—information has been obtained, opinions received and facts gathered, so much in accord-

TABLE R.

COMPARATIVE SALUBRITY OF EACH WARD IN THE CITY.

Localization of *Cases* of epidemic yellow fever, occurring during the year 1853, in the several Districts and *Wards* of the city of New Orleans, (according to their division in 1850,) in ratios proportioned to the population of each.

1	2	3	4	5	6	7	8
DISTRICTS AND WARDS.	Estimated Population of 1853.	Number of Yellow Fever Cases *Reported.*	Ratio per 1.000 of the Population.	Number of cases from Public and Private practice unreported.	Total Number of Cases.	Ratio per 1.000 of population, of the whole.	Estimate of the Proportion of COLORED to the Whole Population in each DISTRICT
1st District.							
1st Ward,..	7.179	2.567	.357	732	3.299	.459	
2nd do. ..	6.447	1.092	.169	312	1.404	.217	
3rd do. ..	9.453	1.211	.128	346	1.557	.164	
4th do. ..	9.125	1.535	.168	438	1.973	.216	
5th do. ..	8.545	794	.092	226	1.020	.119	
6th do. ..	9.639	910	.094	260	1.170	.121	
7th do. ..	10.307	2.988	.289	852	3.840	.349	
Totals,.......	60.695	11.097	.182	3.166	14.263	.234	13.55 pr. cent.
2nd District.							
1st Ward,..	6.105	365	.059	143	508	.083	
2nd do. ..	4.671	582	.124	228	810	.173	
3rd do. ..	4.089	295	.072	115	410	.100	
4th do. ..	7.389	459	.062	179	638	.086	
5th do. ..	8.561	760	.088	298	1.058	.123	
6th do. ..	13.237	366	.027	143	509	.038	
7th do. ..	5.934	318	.053	126	444	.074	
Totals,.......	49.926	3.114	.062	1.232	4.377	.087	26.17 pr. cent.
3rd District.							
1st Ward,..	12.227	566	.045	193	759	062	
2nd do. ..	5.120	891	.174	305	1.196	.233	
3rd do. ..	7.426	928	.128	317	1.245	.167	
4th do. ..	3.429	024	.007	8	32	.009	
Totals,.......	28.202	2.409	.085	823	3.232	.114	24 . pr. cent.
4th District.							
1st Ward,..	3.220	1.407	.436	341	1.748	.542	
2nd do. ..	3.460	1.175	.339	284	1.459	.421	
3rd do. ..	3.347	1.371	.409	332	1.703	.508	
4th do. ..	3.169	1.114	.351	268	1.382	.433	
5th do. ..	2.114	586	.277	370	956	.452	
Totals,.......	15.310	5.653	.369	1.595	7.248	.473	12.05 pr. cent.
Grand Total,..	154.133	22.304	.144	6.816	29.120	.188	

ance and corroboration of the sentiments so fully expressed in other parts of this Report, that it seems to be tautology to repeat them here. Nevertheless, as facts, however, portrayed to the eye and of localities near and around us, known to all, have, usually, a more lasting impression upon the mass than theoretical principles, or statements from abroad, however strong, appropriate and well founded—attention is invited to the delineation of these various sources of disease on the Sanitary Map, and then to the table R, to show the *consequences* of them. So clear and convincing are these facts, when brought to explain each other, that longer skepticism on the subject is set at defiance. Let us, then, scrutinize them under the following circumstances: 1st. If, on examination, it is found that when the various sources (above enumerated) are found, and there, likewise, has prevailed the yellow fever, and almost in *precise proportion to their existence.* 2d. If this fever has prevailed there, not only in numerical proportion to the population, but in *proportionate malignancy.* 3d. If we find that all antecedent experience which has influenced society in the establishment of sanitary measures, is here confirmed and corroborated. 4th. That our city has been suffering a frightful calamity, resulting in great injury to the population, and a ruined reputation, *and from removable causes;* and, finally: 5th. That all, or nearly all our past calamities *could have been prevented!* Surely, there will be no longer any hesitation as to the adoption of the most efficient and speedy measures, not only to correct them and prevent their repetition, but to set *ourselves right in the eyes of our countrymen and the world*, to whose public opinion none are too exalted and none are too low to be independent of, or uninfluenced by, as well for the sake of the direct interest of the city itself. But to the proof—and I shall commence with the upper part of the city:

Propositions.

And results.

THE FOURTH DISTRICT.

This district is estimated to have contained, in 1853, fifteen thousand three hundred and ten inhabitants, without including a large proportion of recent immigrants, the whole of which, for the year, has been estimated, in another place, at about five thousand, divided among the four districts in a very disproportionate degree. These, of course, were first subject to, and earliest felt the epidemic influence, and living mostly in impoverished circumstances, were crowded together in the cheapest and most comfortless dwellings. The number of cases of yellow fever in the entire district, is estimated to have been seven thousand two hundred and forty-eight, of which five thousand six hundred and fifty-three were reported to me by the physicians in attendance, in which also are included those from the Howard Association, and other institutions, and the balance allotted, by the Sanitary Commission, from public institutions and physicians not reporting. Being at the rate of four hundred and fifty-two per thousand of the population; more than double that of any of the other districts.

Population and number of cases in 4th District.

Ratio per 1000

Causes.

Let us see how this can be reasonably accounted for.

1st—Want of pavements.

1st—In this district there are but two pavements. These are of cubic stone blocks, and are very good, as far as they go. One extends across the entire breadth of the district, near the river, and the other one-third lower down and about one-half of the breadth. There are several extensive plank roads, (which are delineated on the map,) but much the largest part of the district is not paved at all, and especially the sickliest portion.

2d—Low lots or ponds.

2d.—This district has a vast number of unfilled squares and lots, below the level of the streets; some of which are even built upon, on piles or bricks, having water almost constantly under the houses, which are of wood, old and rotten, and during the rainy season, (which is the sickly season,) become *ponds*, and often very nauseous ones too, and are at all times the receptacle of filth and impurities, the drainings of the yards. These are also mostly noted on the map.

3d — Three cemeteries.

3d.—Three extensive *cemeteries* exist in the district, in which were buried, last year, near three thousand dead bodies. It was in one of these that the offensive exposure of bodies occurred, so painful to the public.

4th.—Not far from the centre of this district, was the earth exposure, necessary for laying down the Jackson and Lake Pontchartrain Railroad; and within its limits exist one of the most dangerous and disgraceful nuisances in the city, the half filled Gormley Basin and Canal, the common receptacle of the drainage and filth of a large portion of this and the adjoining district, bordered by most offensive tallow and soap manufactories.

4th—Earth exposure and Gormley's basin and manufactories.

5th.—Probably almost equal to any of these, are the low, crowded, filthy lodging houses, particularly in Adele, Rousseau, and St. Mary streets.

5th—Crowding houses.

6th.—And finally, the extensive butcheries and vacheries.

These amply account for any amount of sickness, when united to the remarkable meteorological condition of the year, to the entire satisfaction of any inquirer after truth, and who will apply the best recognized principles of medicine to its explanation.

Slaughter houses, &c.

With special reference to the wards themselves, it may be said that the *First Ward*, which has the largest ratio of insalubrity, that a very large portion of it in Adele, Rousseau, and St. Mary streets, were but a series of low, crowded, and filthy "pest houses," inhabited by the lowest class of people, with scarcely any pavements, and many unfilled lots and stagnant reservoirs of putrid water. The proportion here was five hundred and forty-two per one thousand.

1st Ward—Causes and proportion.

That the next worst ward, *the Third*, contained all the cemeteries, and most of the vacheries; on the lower portion it was bounded by the new Jackson street railroad, (five-eighths of whose laborers fell victims to the epidemic) and the swamp. The proportion here, was five hundred and eight per thousand.

3d do.—and do.

That the next worst *ward*, *the Fifth*, contained all the butcheries, and many low empty lots or ponds. The proportion here was four hundred and fifty-two per thousand.

5th do.—and do

That the *Fourth Ward*, which is the fourth also in the ratio of cases, more than three-fourths of the cases actually occurred immediately around and in the vicinity of that horrid nuisance,

4th—and do.

Gormley's Basin and Canal, and the extremely offensive soap and candle factories about them, the rest of the ward being comparatively healthy. The proportion is four hundred and thirty-three per thousand.

2d—and do

The Second Ward has numerous low lots, (or rather ponds,) houses on unfilled lots, small crowded tenements, and few pavements. The proportion here is four hundred and twenty-one per thousand. The boundaries of the ward are shown on the map.

Malignity of the cases in proportion to concentration of the cause.

The character and malignity of the cases in portions of this district eminently illustrate the position, that wherever the causes enumerated existed in excess, the virulent character of the disease was usually proportioned, and that there existed there a concentrated influence, inimical to human health and life, that set at defiance, in a great many instances, all skill in medicine, and all the resources of art and kindness. Two of these have been particularly reported to me, viz: the vicinage of Gormley's Basin, and Adele, St. Mary, and Rousseau streets, near it, in the immediate neighborhood of both of which places, the epidemic had some of its earliest victims. Of the first, an intelligent physician, who had a large and painful experience, reports to us, that he "Here witnessed the disease in its most "malignant and revolting aspect. It was not in individual cases "only, that it thus showed itself, but the type in the district "was uniform; day after day I was reminded most forci- "bly of Boccacio's graphic description of the plague in "Florence; they almost uniformly bid defiance to every "variety of treatment. From the very inception of the dis- "ease, dissolution was stamped upon their countenances, "with a distinctness appalling to behold. Not only this, but "even in the small minority that recovered, their recovery "from the fever was followed by the appearance of furun- "culi from the crown to heel; and in one or two their shat- "tered frames sunk under the drain which followed their "maturation. The condition of this portion of the city was "disgusting and revolting beyond all expression; filth of "every character crowded the streets, gutters, pavements, "and even the houses in many instances.

Remarks and observations of the same tenor have been made to me by various members of the Howard Association in relation to the cases in Adele street, and its neighborhood, where they so nobly devoted their time for the benefit of suffering humanity.

The First District, or next in order, is estimated to have contained 60,695 inhabitants—11,097 cases of yellow fever were reported to me by the faculty and members of the Howard Association and public institutions, the balance, or 3,166, was estimated by the Sanitary Commission, upon the grounds already stated, from public institutions, and physicians not reporting—producing an aggregate amount of 14,263, and a ratio to the whole population of 234 to the 1,000.

1st District—Population and cases.

The difficulty in accounting for the sickness here is no greater than in the district above it. True, it has more pavements, but a very large portion is without them, and they are of the worst kind (or pebble pavement)—but very partially protecting from evaporation or absorption. The sanitary condition of the whole river front of the First and Fourth Districts was doubtless influenced much by the extensive disturbances of the soil on the opposite side of the river, the wind blowing almost every day from that quarter, and also from the foul ships in front of them.

The *First Ward*, bounded by Felicity, Benjamin, Magazine and the river—exhibits the largest ratio of sickness. Here existed the spots of *Lynch's Row*, and a nearly similar one on Tchoupitoulas street, and many other houses in the neighborhood consisting of crowded, filthy tenements, with unpaved yards, privies running over and into the streets, the nests of the lowest and most intemperate population, and so of Whitney's old pickery and of similarly offensive blocks in Pacanier and other streets. These fever fountains have been for years the receptacles and manufactories of pestilence. Whenever an epidemic has visited the city, whether yellow fever, cholera, ship fever, &c., here have been its favorite haunts. "Lynch's Row" is enti-

1st Ward—Lynch's Row

Whitney's pickery.

tled to the pre-eminence, for, I am credibly informed, that during the epidemic cholera in the winters of 1848–'9, no less than 108 dead bodies was taken from it in a very short time. It is conspicuous for its filthy and crowded condition, with overflowing privies and bad ventilation, as they all are. To which add an extensive river front with the banks the receptacle of filth, the batture embracing ponds, with exposure of soil in relaying Annunciation street, during the summer, and intercourse with filthy ships, and the condition will fulfil any expectation of insalubrity, however exaggerated. The number of cases traced to and allotted to it is 459 per 1,000.

Blocks in Pacanier and other streets.

The next worst *Ward is the old Seventh*, formed by the new Canal, Circus and Canal streets, and the swamp. Here we have an extensive disturbance of the soil for laying pipes for five or six squares down Perdido street, from Philippa—the Girod street *Cemetery*, where was buried during the year 638 bodies —the filth from the dredged canal, and the open canals and drains and receptacles of filth from the upper part of the city and swamp in the rear, and the fever nests of *Hoey's and Cole's Rows*, near the Work-House, consisting of small crowded filthy rooms, badly ventilated, with bad supplies of water. This ward is but partially paved, with the same kind of pavement as in the first—the cross streets not at all; in this ward are located two extensive *Hospitals* and the *Gas Works*, occupying several squares, having large open drains and the swamps just in the rear. The number of *cases* of yellow fever in it was 349 per 1,000.

7th Ward.

Nuisances in.

The *Second Ward* having for its limits, Magazine, Felicity and Thalia streets, have scarcely any pavements, the open Melpomene drain extends nearly through its centre, extensive disturbance of the soil occurred for the laying of pipes in Pyrtania, Apollo and Bacchus and Clio streets, and Gormley's Basin and Canal immediately adjoins it. The proportion of sickness was 277 per 1,000.

2d Ward.

Causes.

The next in rank is the *Fourth Ward*, margined by Thalia, Camp to Julia and down Julia to and with the canal. This is characterized by having the open drains of part of the Melpomene, with its refuse of city filth exposed to the atmosphere, the open Triton Walk conduits and the stagnant canal, with the

4th Ward.

Causes.

exposures for laying down pipes in Prytania and Camp streets, Apollo and Bacchus streets, extensive exposures of earth for several squares (5 or 6) in Erato street, from Dryades for the same, also at the lower end of Calliope street, for the same and for railroad purposes. The ward is but partially paved and very badly drained in the rear, and very low, and badly supplied with water for the purposes of cleanliness. The proportion 216 per 1,000.

The *Third Ward*, bounded by Benjamin out to Camp and down Camp to Julia, and thence to the river, embraces the crowded thoroughfares and dwellings about the market and in North and South streets; the fever brooding place of 82 *Julia*, better known as *McConant's* or *Mitchell's Yard*, *Leed's Row*, on Melicerte street, the old German Theatre on Magazine street, and about the "triangle" with their crowded, filthy and bad ventilated rookeries, with a large exposure of batture in front, and its filthy bank and wharves—the result here is 164 per 1,000.

3d Ward.

Fever nests.

The *Sixth Ward*, within the limits of St. Charles, Canal, Circus and Julia streets, is well paved (but with pebble stone only) and contains the dangerous nuisance and fever spot of *Kirwan's Row*, in Philippa street, sometimes known as "*Irish Row*," and was the theatre of a large mortality last year from the crowded, filthy and unventilated condition of its rooms—the same objection holds to the confined and crowded buildings around Poydras Market, and the filthy and immoral receptacles in Perdido street, and the "fever nests" produced by the large *livery stables* vitiating the atmosphere of an extensive neighborhood, near the very centre of the ward, and having the refuse of extensive hotels. The proportion is 121 per 1,000.

6th ard.

Fever nests.

Causes.

And lastly, the *Fifth Ward*, bounded by Julia, St. Charles, Canal and the river: this ward is similarly placed, and being the location of the principal hotels and restaurats, is exposed to their refuse, with their susceptible subjects of recent immigrants and strangers, its bad sanitary condition must be attributed largely to the disturbance of the soil in preparing

5th Ward.

Causes.

to erect the large number of new buildings in front, and in taking up and preparing for new pavements there, and for gas, and water; the extensive batture and filthy river banks and wharves, and the large livery stables in its limits. These last mentioned wards were not visited by the fever until a late period. The proportion here is 119 per 1,000.

2d District. Population and cases.

THE SECOND DISTRICT.—This contains an estimated population of 49,926, with 3,145 cases reported to me by private practitioners, and occurring there, known to the Howard Association, with an allotment of the balance to make up 4,377 cases, or 87 per 1,000. The cause of this immense difference is obvious enough, and although the several wards differ in their proportions of these cases, the causes are as manifest as their great difference in amount.

2d Ward. Causes.

Ward No. 2, bounded by Canal, Rampart, St. Louis and the Swamp, having more than double the amount of the average of the district, or 173 per 1,000 embraces in its limits all the *cemeteries* of the District, (of *four squares*) and in which were buried last year 1,163 bodies, the open and half stagnant Claiborne and Canal street drains, and the filthy conduits in the rear, the receptacle of a large portion of the foul and corrupting materials of the upper part of this portion of the city, and vicinity, and the influence of the swamps and open drains beyond.

5th Ward. Causes.

The Fifth Ward, immediately North of this to St. Philip street embraces the open canals, Carondelet and Claiborne, the recipient of the filth of the upper portion of the city and not beyond the influence of the large exposure of earth made for this canal and its new basin, and its enlargement. The proportion here is 123 per 1,000.

The most of the balance of the cases in this district occurred in the front portions of the third, fourth and sixth wards, in the vicinity of the markets, and in the disgusting and horrid purlieus of this neighborhood, in the first few blocks of *Main street, Philip and Ursuline streets, and in Gallatin street.* Language fails in portraying the loathsome exhibition which these *fever manufactories* presented; they can only be paralleled by some of the plague spots in the first and fourth districts. A large portion of them consist of boarding or rather lodging houses, occupied, many of them, by crowds who only sleep there, eating and working out, with no privies, (these being monopolized by the tenants on the ground floor,) the streets and levee opposite are used for this purpose; small rooms are sometimes occupied *by whole families;* some use them for raising fowls and dogs, and as receptacles for vegetables for market, and the refuse of the unsalables of the market, from day to day, with little regard to removing the half decayed relics. No doubt these conditions were greatly aided by disturbing Chartres and Royal streets, for relaying pavements, and Bourbon street, for laying down large water mains. An active and efficient practical member of the Howard Association, who attended in this part of the district in his report to me says that "along every street where *paving or digging* for laying the water pipes was carried on *the disease was remarkably more intense*, and also from actual observation, here and in St. John Baptist, the mortality was greatly in proportion to the rooms or houses being nearer the ground." The filthy state of the river bank opposite, (the river being very low, as it always is during our epidemics,) and particularly that portion devoted to the drainage of sugar and molasses. The balance of that district is comparatively healthy, being well paved, with a large proportion of acclimated population, which aids much in explaining the comparatively inefficient influence of the pestiferous spots pointed out, on the population.

Fever nests in front of the 2d District described.

Is it at all astonishing that pestilence here has its favorite haunts? Is it not more astonishing that it does not exist here, and in such places every year—nay, all the year? Nothing shows clearer to my mind the conviction of the true explanation of the views put forth in a preceding section in relation to the necessity of the existence of *two conditions* for this class of fevers. It surely is a munificent and merciful dispen-

The reason why yellow fever, &c., not all the year, and why limited to 60 or 90 days.

sation of Providence, otherwise, the local population of such tainted spots that I have pointed out would be entirely cut off, and why is it that yellow fever epidemics have a limited duration of from sixty to ninety days, whether it breaks out early or late? the meteorological change always ensues, *with—drawing one of the conditions* on which the pestilence depends!

3d District, Population and ratios.

The Third District contained an estimated population of 28,202, in which 2,409 have been reported to me, and 823 have been allotted to it, (as before explained of the other districts) making 3,232, or 114 to the thousand. This is a large number for that district, and arises mostly from the crowded and filthy condition of localities and houses devoted to purposes such as I have just described about St. Philip and Main streets; these are their rookeries in and about Enghien and Moreau streets, the dirty, rag depository on Ferdinand street, a four story block, the receptacle of every species of outcast filth; cheap lodgings for immigrants, and the poorer and more reckless of the laboring class, requiring always the closest surveillance on the part of the civil authorities to prevent their creating and evolving a poisonous atmosphere that will infect the neighborhood, and in no situation is the paternal kindness and vigilance of municipal government more conspicuously shown, than in correcting and repressing the haunts and manufactories of disease, crime and vice. It is arresting it at the fountain head, it is ascending to its *sources*. The cupidity of landlords who lease, and the sub-lessor, even to the third and fourth classes, who does it under him, the sole object of whom is to derive the largest profit out of the smallest space, and the least trouble, doles out to the poor occupant the least possible space; these, in many instances, are immigrants, who are ignorant of the pregnant fact that crowding here is much more dangerous than it is in cold climates, where they come from; it is also composed of a large portion of our valuable laboring class, who are mostly reckless, and also ignorant of or unable to apply any measures

Consequences on the community.

of personal hygiene; the consequence is the inexorable penalty, in loss of health and life; the neighborhood becomes infected, and the community suffers directly, and indirectly, for the support of hospitals, infirmaries, and orphan asylums, the repression of crime and vice, the extension of disease, and also in the loss of labor, that is one of the main ingredients in its wealth, and in loss of character

Most of the cases in this district were from *public practice*—(that is from eleemosynary associations,) showing at once the character of the subjects and the sources of the disease. The balance of the district exhibits a very low milesimal insalubrity. The disturbances of the soil, in digging for laying down pipes, and the cleansing out drains, and exposing their detritus to the summer's sun, and the filthy bank of the river in the neighborhood, being the common deposit of filth, here existing the greatest insalubrity, (this nuisance has been a common cause of complaint for years,) together with the polluting air of a cemetery, in which was buried during the year 2,446 bodies, aided much in adding to the number and force of the epidemic here. The map shows the location of these, and reference to Table R will exhibit the state of each of the wards, here and throughout the city.

Cause of insalubrity.

In the allotment and distribution made of the cases to the several wards and districts, it will be seen that there is a vast difference in numerical ratios. It is to be borne in mind, however, that there is a great difference in the relative number of the acclimated in each of the districts, being greater in the respective districts in the inverse ratio of the number of cases, but, most manifestly, in insufficient amount at all to diminish the force and nature of the conclusion come to, that the cases occurred in precise proportion to filthiness and crowding, and the other conditions named of the several localities specified, and some of these in the Second and Third Districts, would nearly vie with some of the worst in the districts above, and had the proportion of unacclimated subjects been greater, the number of cases would more nearly have equalled some of the worst fever nests and plague spots up town.

The number of acclimated population diminishes the ratios.

Algiers.

Population, ratio and cause.

The condition of the population on the opposite side of the river, is not embraced, directly, in our investigations, and hence it has not received that attention we have devoted to this, and our information is less definite and special. The white population is estimated to have been about 3000, and there was probably fully half that number of cases of fever. This was, no doubt, mainly caused by the large disturbance and exposure of the soil for the railroad and levee.

Origin of the fever.

How the fever spreads from locality to locality.

Difference in Northern cities, and cause.

It is well known that the disease commenced at its various headquarters—pest houses and infected localities, and the filthy shipping mostly from Northern and European ports, about the same time; that it continued in most of them throughout the season, that in a very few (probably but one) it attacked the most susceptible subjects only, and then abated for the nonce; that it always seizes the most susceptible first; that this is usually in the filthiest, worst drained and paved, and worst ventilated and most crowded portions of the city; that here it seems to gather force and strength, and extend to neighboring portions, that this was specially verified with us, and that to show the nature of pavements alone, it was at least a month and even more after the epidemic broke out, before it reached the paved portions of the city, and those grades and classes of society that paid more respect to their hygiene—personal and domestic—that so influential are these in their protective capacities, that some susceptible families and subjects, living almost in the midst of the infected districts, escaped, almost entirely, by proper attention to them; that, finally, the whole city atmosphere seemed more or less tainted with the influence and extension of the poison, as the *materies morbi* became more matured and the resisting power overcome, as if the multiplication of decay, disease and death consumed the ozone or purifying element in the atmosphere. It thus seemed to form an electric chain—the links successively feeling the influence until the whole becomes affected and surcharged. Northern cities are differently situated from ours in their variations of elevation, and of course, in their atmospherical relations, an epidemic yellow fellow has *consequently never prevailed throughout their entire extent.* So true is it, that the conditions we have taken so much pains to point out, find illustrations and applicability every where.

There is no arguing against facts,—the most unprejudiced—the most unequivocal testimony is furnished by intelligent men who have no theory to support, in the fullest corroboration of the practical views set forth in this report. And it requires nothing but a visit and familiarity with these haunts of disease and festering sores to convince the most skeptical that filth (crowding is the same thing—for it speedily generates it) high temperature and humidity produces yellow fever,—and yellow fever of the worst form,—that its type usually depends upon the concentration of the productive causes, with individual exceptions, with strong resisting power—the *exceptio probat regulam*,—that from these *foci*, it emanates as by radiation and expansion—dependant somewhat upon the direction of the wind, and thus contaminates the entire community (where the conditions can be assimilated.) These facts are conclusively shown by the manner in which the disease originating in these centres—spread during the last summer. And it is well known that where yellow fever is not the result (as this is confined to a certain class of subjects) nearly all other diseases are aggravated by it, by lessenning the tone and vigor and resisting power of the individual. ALL then are interested even to the extent of the health and lives of their families, in the earliest adoption and strictest application of sanitary measures—and to be coerced with the whole force and funds of the body politic.

No resisting plain facts.

Why all interested.

With all our labor, and it has not been small—we have proved little more than has been proved a thousand times before,—that one of the most efficient agents in the production of yellow fever is filth of all kinds. May it be estimated as a corroboration of antecedent and well established facts and convictions;—may it make a *practical* impression at home, since they have occurred in our midst, and been but the application of the pregnant facts occurring in localities, that cannot be forgotten by those who witnessed them. If there are other opinions,—as would seem, by our having done so little heretofore to prevent

The occurrences around us more apt to be impressive.

these terrible results—they have been gravely rebuked by the occurrences of the year, and must now yield to the demonstration before us, "*opinionem commenta delet dies—natura judicia confirmat.*"

No man can say—or ought to say—that he can dodge—or is uninterested in this question. If he is no longer subject to *yellow fever*, yet vitiated air affects the sanitary condition *of all.* Is there one so insulated that has the effrontery to say, he is not interested in what so deeply affects the welfare and prosperity of society, pecuniary, commercial, social, moral, religious? if so, society should arise in its might and banish the wretch from among us,—he is no longer fit to participate in the numberless blessings for which we are indebted to the kindness of a merciful Providence.

Proportion of natives and those born elsewhere in New Orleans.

The largest portion of the population of this city, has had their nativities out of the State. The United States census of 1850 informs us, that *but one-third* of the population only claims a *Louisiana* nativity or 38,337,—that 18,136 derive theirs from other portions of the United States, and that 55,541, or nearly half come from foreign countries, leaving out the colored population altogether. The proportions in which they have been affected by the epidemic, is stated in table H. On the "cost of acclimation"—Section III. It is evident that this large immigrant population, forming more than two-thirds of the white population of the city—and constantly augmenting in a still greater ratio, claims the greatest value—in measurably making this city what it is (and what would it have been without them?) and every consideration in a hygienic point of view, for they form the element of its future growth and destiny.

SECTION X.

REMEDIATE OR PREVENTIVE MEANS.

How far man can control temperature, moisture—Influence of wooden houses—Best pavement—How to influence winds—Whence their bad qualities. How and when streets to be *cleaned—Custom elsewhere—Empty lots as a source of disease—Other causes, Gormley's Basin. Streams of running water in the streets. Difficulty as to privies—The great one—How remedied—Value of drainage—No farther burial in cities—Best water, what—City water and city air the same—Plenty of water required for health. Surveillance in erection of houses—Certain buildings forbidden in cities for a two-fold reason—Influence of social habits on yellow fever.*

In the practical application of these important measures, the only value of the preceding investigations—we propose treating them in the same order we have heretofore embraced.

HEAT AND RADIATION (i. e. direct and indirect.)

To say that man has no influence on meteorological conditions, is to degrade him to the level of the lower animals. Man is, probably, the only animal that understands how to arrange temperature to suit him and apply it to his diversified wants, and has been defined by some naturalists "a cooking animal." Temperature when too great is controled by domestic covering of various kinds, by large rooms with lofty ceilings and by occlusion. St. Paul's in London, is said to be 10° cooler than the surrounding buildings (from its vast extent), and so of all large rooms. By excluding reflected temperature and keeping the rooms dark, we can here procure a temperature, seldom exceeding 82° 4'. So great a difference does this make when effectually done, when aided by thick walls to prevent the transmission of heat, that we can in this way approach the average temperature of the latitude. The depression accomplished in this way, at the North, between in door and out door temperature, is so great that some physicians there, have given it as their opinion, that it may be even hazardous to health! Large rooms with the power of perfect occlusion here, would answer many valuable purposes. They would not only be cooler, but supply a body of fresh air, and if opened at proper times only, be drier. No one, rightly informed, dreams of a high temperature being the *sole* cause of yellow fever; otherwise it would prevail over half the habitable globe. That a prevalence for some

Man's influence on temperature.

months of a range from 80° to 88°, is essential to its production has been shown in another place, and is undeniable. With an average temperature *throughout the day* of about 79° during *the five warm months*, every mode by which we could protect ourselves from direct and reflected temperature should be adopted, planting trees in the public squares and broadest streets, furnishing shade and pure air during the day, and absorbing the noxious gases during the night, encouraging the erection of verandas to our houses, erecting an extensive shed on the river bank, where is the greatest exposure of the unacclimated population, and serving for recreation when the business hours and business season is over, during the sickly period of summer, streams of water constantly passing through our streets during the day (not night,) would greatly promote this important and healthful purpose, the more so as the temperature of river water is much below that of the air.

On a larger scale.

The important *practical* question then is answered, that by these means we have much control over temperature. This is done on a large scale, by extending our improving hand into the neighborhood, removing the forest growth, and draining the swamps and cultivating the soil. We not only lessen the amount of moisture thereby, which does so much injury, but exchanging the moist to a dry condition, we increase the perflation thereby, and hence by increasing evaporation (the drying power) and lowering the dew point, we really lower the temperature to our feelings, at least 5° during the warm months now, and it would be greatly increased with the improvement suggested. This has actually been already accomplished here in relation to temperature to a certain extent, by our more extended clearings creating increased ventilation, beyond that enjoyed in 1807–'10, for by comparing Lafon's tables at that period and ours now, there is an average depression of about 3°, while the extremes are less.* The influence of temperature is so great on health that it has been ascertained in London

Actual proof here.

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* See chart to Report to State Medical Society.

from actual observation, that a depression of 10° *in winter* is fatal to 300 additional of its *poor* weekly!

It is perfectly obvious, the nearer we can make a city approach the country of its vicinage, as to heat, moisture, dryness, and cleanliness, and all those conditions which conduce to purity of air, and of course, salubrity, we shall, in the same proportion, improve it. There are few rural districts in the United States much more healthy than those in our neighborhood. The average mortality during a very sickly year, when the United States census was taken, made it amount to about two per cent., which is a convincing fact that the climate is not sickly *per se*, but has become so from superadded conditions. Let this encourage us to renewed exertions and bring it back to what it has been and *ought to be*.

Just how it ought to be.

Moisture, probably the most important meteorological condition that influences the health of man, is the moisture in the atmosphere, I mean that condition which is beyond and measurably independent of rain. This is *measured* alone by the hygrometer, its destructive influence when conjoined with a high temperature is well known and has been dwelt upon in the preceding pages. Rains, in ordinary seasons serve to deplete temporarily, the atmosphere (as shown by the hygrometer,) not so last summer. There was almost constantly a high dew point, indicating a repleted condition, productive of a want of elasticity in the air, a constant sense of great fatigue, easily induced, an exhaustion of nervous energy and a constant demand upon the system for a fresh supply of power to sustain the flagging energies of life; the perspiration became offensive "funky" that no washing could long remove, and may have aided in giving rise to the opinion entertained by many of the faculty, that they "could detect a yellow fever subject by the smell alone."

Moisture.

Most fortunately for us, this most destructive agent can be greatly controlled by a removal of the multiplied causes of its existence in this city and neighborhood, which has been pointed out, as our unfilled lots and squares, (in wet seasons made ponds of) unpaved and half paved streets, (as pebble pavements may

How removed and remedied.

be denominated), and back yards, our partially drained vicinage, open conduits and neighboring swamps. Hence the constant fogs to which we are subject, the dampness of our stores and houses, immeasurably increased by the erection of buildings directly on the damp soil, (the floors thus lasting only three or four years), instead of being at least a foot above it, for the purpose of ventilation. The first stories of all buildings are more damp, and consequently more unhealthy, than those above them—moisture not being an elementary constituent of the atmosphere, but only held in suspension by it. The Italians know this so well, by long experience, that they only occupy the upper apartments for sleeping. We are thus, measurably, above its reach, and the higher the better, especially during the existence of mortal epidemics, and particularly during those hours when we are most susceptible of disease (at night.) That poisonous exhalations that affect our health are limited to the lower strata of the atmosphere, from whence they arise, there is little doubt. Whether it arises from its combination with moisture, it has not been certainly ascertained, although most probable. As a practical proof of these views, it is well known that when in Constantinople, Aleppo, and other cities of the East, Europeans retire to a domestic quarantine, during the existence of the plague, they escape the disease by confining themselves to the upper floors of their houses. In like manner in the lower districts of Maryland, Virginia, the Canadas, and Georgia. Those persons who sleep in the upper stories are, during the autumnal season, most exempt from bilious fever.

Italian custom.

In the East during the plague.

Wooden houses here, besides decaying sooner, are more liable to partake of all the Hygrometric (as well as thermal) properties of the atmosphere, than brick, and hence should be discouraged as more prejudicial to health in this climate. Doctor Rush has said, that in the yellow fever of Philadelphia of 1793, the greatest mortality took place in wooden houses. This certainly accords with experience here and in Savannah. In Northern cities much improvement in salubrity has been ascribed to

Why wooden houses bad

the abandonment of wooden materials in the construction of houses, and in London, an exemption from the plague since the great fire of 1656. The liability of liquid filth to sink into and adhere to wood, will aid much in accounting for its insalubrity, besides the meteorological explanation of its great liability to decadence. It was a noted commendation of an Emperor of old, that he "found Rome built of brick, and left it of marble." I trust it will be the distinction of this generation to substitute brick or stone for wood in all cases in this city.

Experience elsewhere.

A large portion of all this can be remedied by a *perfect pavement*, which, for this climate, should consist of *materials that would neither admit of absorption nor evaporation*, by a *thorough*—not partial—(for then it is much worse) *draining of the entire neighborhood*, and *then* a renewal of the forest growth. Here ventilation comes in to the aid of temperature in the desiccative process. By having the drains covered, by filling up all low lots—if these are done effectively, and the system of draining duly adjusted—it *must be* drier in the city than in the country. But if the roofs of the houses are of shingle, and no pavements, and imperfect drainage, the water that falls settles or sinks mostly in the soil, sapping the foundation of the houses, rendering the floors damp and filling the air with vapor, or remain in the soil until an elevated temperature brings it forth in all its fatal combinations.

Thorough drainage.

Paving necessary

The best protection that exists against most of this, exists in a *pavement* that will neither absorb or retain water or anything else; that is, one that neither permits absorption or sinking into the soil, nor exhalation from it; that, while it is perfectly convenient for all the purposes of communication, either of pleasure or business, at all hours and seasons, rapidly carries off the water that falls upon it, which, to us here, is of almost equal importance. This is nearest fulfilled by one of iron, by cement of different compositions; next, with cubic blocks of stone, united by cement; then, of thick plank, and *lastly*, by round or pebble stone. To these last, the objection is very

What constitutes a perfect pavement.

decisive, as it fulfills but in a very partial degree the primary objects mentioned. It permits both absorption and exhalation, and especially retains, in its numerous interstices, all the filth that falls on it. There is another objection to it, in the difficulty of keeping it clean. It requires ten times more labor than those do which are smooth, and the practice is freely indulged of allowing the dirt so scraped up to remain for hours or days in the streets, to be washed into the gutters by a transient rain, or trampled in by travel, before removal—thus doubling the labor and increasing the danger—while all that the others require *could be exacted* (without much burthen) *from the front proprietors daily.*

The city may be made drier than the country.

If, then, the pavements (in streets and backyards,) are all perfect, the city would be *actually drier* than the country, a most important accomplishment for every purpose. With abundance of water, filth is easily removed *before decomposition*, and we thus, at the same time, obtain *two* important objects, the prevention of moisture and the removal of filth.

Proofs of the value of pavements.

The value of pavements in the prevention of disease, is known in all cities, in every quarter of the globe. It has been eminently illustrated in Philadelphia, Norfolk, Louisville, indeed, in every city on the continent, and beyond it. They are more eminently applicable in a hot climate, with a constant reservoir of moisture beneath, than elsewhere.—It is recorded of Vera Cruz, that so great was their influence that after that city *was paved*, *there were eight continuous years of exemption* from yellow fever, notwithstanding there was a constant accession of foreign population from abroad and the interior!

The drainage by machines, in the rear of the city, should be so effectual that no water should exist within two or three feet of the surface, and that, no doubt, can easily be done. They have already materially lowered the before invariable level of the water beneath our city and suburbs, and the land has *apparently risen* near a foot in consequence.

It is satisfactory to know, that we can both moderate the amount of rain liable to fall, and the amount of moisture as shown by the hygrometer. An extensive, dense forest growth not only invites moisture, (that is rains,) but retains it. Its removal, in clearing the country, is known by experience, to dry up springs, and actually lessens precipitation. I found by measurement, (with my rain gauge,) about one-third less rain in the vicinity of Vera Cruz and Havana, than Baron Humboldt did more than half a century before, most of the original growth being removed by a reckless clearing. The Spaniard cuts down, he never plants, as seen wherever he has established his foot. Spain is probably the most denuded country in Europe. Both the soil and climate of Cuba have been impaired by this wretched system, the seasons altered and the country impoverished. The same has been effected in that beautiful country, Mexico; the foot of Attila has been planted there, and comparative sterility has followed, and were it not for what Baron Humboldt calls "the force of the climate," in many parts of it, sufficient nutriment could scarcely be raised for the support of its inhabitants; and, as it is, occasional famines desolate the population. Such, also, occasionally occurs in our own states, from our rather reckless clearings; the rain gauge has not been sufficiently long in use to measure the exact differences.

Influence on amount of precipitation.

Clearing the low country then, and thoroughly draining it, dries it, and as it has been shown, greatly tends to improve its sanitary condition, is urgently demanded here.

As stagnation of air is always accompanied with most moisture, the converse is equally true. WINDS disperse it, and powerfully add to the desiccative process; and this is in proportion to the *force* with which they blow, and the quarter whence they come. By reference to the table of the "hygrometry of the winds," in the annexed tables P and Q, the amount that each brings to New Orleans, on an average of a series of years, is shown. That from the Northwest having the least, and that of the Southeast most. By clear-

Influence of winds.

ing the country, not only is the *force* of these winds increased, but probably their frequency. "*Force*" of the winds is explained on the caption of the tables, and from actual experience, it has been ascertained, that the quantity of fluid removed from the system, (or surface exposed,) is found to be nearly three times as much in a "moderate breeze," and upwards of four times as much in "a fresh wind," as in a calm or stagnant state of the atmosphere.

Their properties.

To winds have been attributed various *occult* qualities, with special powers; these we pass over, as below our notice, the accuracy of modern science demands something more definite. There are certain qualities which we know they possess, and they are expressed in the above tables. The much dreaded Chamsin, Simoon, Puna and Harmattan are known now to derive their deadly properties mainly from their possessing the *desiccative property in excess*; whatever else they may contain is more a matter of inference. When, for instance, winds blow over certain marshes, or other places, it is deemed that they derive certain properties, from the effects that follow; and this is found in certain countries as an invariable sequence, as that yellow fever never occurs unless where there is a great accumulation of filth, hence it is inferred, that there is some essential connection between filth in the one case, and certain qualities in the marsh in the other. Our epidemics are always accompanied with the predominance of the East and Northeast winds; these blow over marshes, (our Pontines,) mostly covered with a forest growth, which, although not impossible to drain and clear, are far beyond our present resources. These East and Northeast winds, are those also which predominate in Savannah during their epidemics. "For twelve miles they pass over the margin of the river, absorbing the moisture and the poisonous gases on its margins." They have been remarked from an early period, and are called there the "Samiel of Savannah."

But there are winds that bear deleterious properties, and that usually predominate in our autumnal seasons which are in our power, and it becomes our duty to correct, viz:—the *North wind.* This wind blows over the six or eight miles of swampy ground. between Lake Pontchartrain and the city, conveying to us whatever is injurious from it, and is almost entirely under our control, that is, so far as *these deleterious properties* are *concerned.* With these corrected by perfect desiccation, clearing and planting, (shrubbery, grass, &c.,) we shall then enjoy the *protective qualities of the Lake breeze*, so much needed from that quarter, and which gives to New Orleans what no Southern city has, viz: — protection from the *too great* desiccative properties of this wind at a period of the year, (the autumn,) when a certain amount is required for health.

Our influence on the North wind.

The *removal of filth*, as the cause of impure air in cities, and all its baneful consequences, is, at once, the great difficulty, and the first duty of the municipal authorities of all cities, inasmuch as the lives of the citizens is of more value than anything else. And yet, how incompatible with this very natural feeling are the main expenditures of city councils and what a small fraction of the revenues of cities is devoted to the *Health Department!* When the *true interest* of bodies politic and social are *understood* and appreciated, it will be altered.*

Small revenue devoted to preserving health.

As the first great cause of our *epidemics* (the disturbance of the original soil) is certainly the most deleterious, a city ordinance should be passed forbidding it, *to any extent*, during the season of elevated temperature, that is, from May to October, for any purposes whatever; and so of analogous conditions, clearing out and exposing the filth of canals and impurities of all kinds, of half-dried swamps, &c., of the great exposure of filth by deposits on the river bank, and the duration of the exposure of street filth, after it is collected or *spread* upon the streets.

To forbid the turning up fresh earth in hot weather.

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* In the estimate for the expenditures required for Health in New Orleans for 1852, it was deemed that $10,000 was sufficient!—The *direct expenditures* were more than *seven times* that amount and from foreign sources, hundreds of thousands were obtained, and the city injured to the extent of millions! Not to be benefited by an experience that ought to have been so valuable, but to pass the wave of oblivion over it as of the hundred lessons before; this year's estimate for *the same was also* $10,000, while $15,000 was to be devoted to the requirements of the *law expenses*—showing their relative estimation, out of a revenue of $1,600,000! A fair specimen of our reckless injurious follies!

Back yards fountains of filth.

We next proceed to that source—the fountain head of the contamination of city air—we mean the *back yards*, where all the offals and filth of families is concentrated, including privies. As this requires a different action in the present or contemplated condition, we shall separately consider it, and proceed, first, to recommend a mode to get rid of the former.

Filth removed before decomposition,

Every yard should be paved in *cement* and graded to the street to facilitate the removal of rain and refuse water, and prevent it and filth of all kinds, being absorbed into the soil, and constitute a sore to fester wherever the temperature is sufficiently elevated to invite it, which is the case here, nearly the whole year. In each yard should be a well constructed sink below the hydrant and falling into covered drains which should lead to the street sewer. The entire offal of each family should be thus carefully run off daily *before decomposition* ensues, and this great source of domestic indisposition *prevented* by thorough domestic cleanliness, and this is only to be effectively done by abundance of water, the solid parts to be conveyed *directly* to the dirt-cart, notice of its arrival being given by a small bell—the cart should be a close one.

And before sunrise.

Custom elsewhere.

It is our deliberate conviction that all street and yard filth should *in this climate*, be removed before *sunrise*, (at least in the hot season) before the influence of the morning sun has had power to exhale the poison of the compost to the atmosphere, and before drays and carriages or rains have spread it again on the streets, and the dirt-cart should *immediately* follow the scraper, and by *sunrise* every thing be found clean. This night work is done in New York, and although not sufficiently done, *yet it can* be, and *ought to be*, and particularly *here*. In the city of Mexico an excellent custom prevails of enforcing upon tenants the duty of sweeping their half of each street to the centre by *sunrise* every morning, and thence it is removed by the public carts. This could be most reasonably and should be, exacted here on all streets where the corporation has incurred the additional cost and the occupant enjoys the additional privilege, of having square blocks placed before his property. It should be required for seven months *daily*, and for the balance of the year *weekly* might suffice. The dirt should be removed to the rear of the city. This, with the water running in the streets (as advised by our colleague Professor Riddell) would effectually answer the important purpose of keeping the portions mentioned clean and pure.

No filth must be left on the *banks of the river*, and a special police be detailed when the river is in a falling condition, which is precisely that period of the year when it is most dangerous to the public health, (viz: July, August, and September). See tables C, D, and E.

Bank of river kept clean.

All lots lower than the crown of the street should be filled up immediately.

Low lots filled up.

Livery stables and vacheries, containing over four head of cattle, should be removed beyond any square containing fifty population or ten dwellings; the same of all *slaughter-houses*, *soap, bone and candle manufactories*, or others creating nuisances all chimneys connected with any manufactory or trade injurious to the public health (as defined and interpreted by your Health Department), should be removed summarily, if the offensive material or quality cannot sufficiently be got rid of by the chimney being elevated high enough to consume it, or extending it beyond the atmosphere of our dwellings.

Vacheries and manufactories removed to a certain distance.

Gormley's Basin should have lime spread over it and filled up, and the space planted with trees and shrubs, and the place appropriated to the public as a square for recreation and refreshment; the canal leading from it, together with Melpomene, and all the draining canals, covered, and when cleaned out—which should always be done in the winter season—their dangerous filth immediately removed to a distance, and in bulk, and lime spread on it.

Gormley's basin filled and planted.

Our project contemplates *running water constantly* through the streets *during the day*, and all the draining canals, and as the temperature is, on an average, at least five degrees colder than the temperature of the air, it would aid much in cooling the atmosphere of the city.

Running water in the streets.

Whenever *stagnant water* is exposed to the sun in moderate temperature, vegetable infusoriæ, of the class algæ, and also fungoid vegetation, appear rapidly.* Many tribes of these vegetable productions appear to die with great rapidity—sometimes in one or two days—and then decompose. Immediately after these, animalcular life appears. Stagnant water is the most favorable to this order of vegetable productions, which, in giving rise to animalcular life, appears to keep pace with the animalized excreta discharged in the house drainage of towns. This insalubrious order of production is indicated by the smell in stagnant or nearly stagnant ornamental waters, such as the stagnant portions of the Serpentine rivers, which have excited so much declamation. Certain degrees of motion in water are unfavorable to the production of *algæ* and other infusorial plants, the tissues of which are destroyed by swift motion, but a large portion of them are found in slow running waters or open canals with little traffic. The same round of life and death also takes place in open and shallow reservoirs, and in open cisterns, where the water is frequently changed.

How efficient

Light required.

Light, however, appears to be necessary to the production of infusorial and fungoid vegetation, and their formation is prevented by such covering as excludes the light and heat of the sun.†

Night soil one of the greatest difficulties.

Night Soil.—This is one of the greatest nuisances of large cities—probably the greatest—as tending more to the deterioration of the purity of the atmosphere than any other, and is the most difficult to be got rid of, where declivities are not large and water power great. Its large amount—the poisonous qualities of the gases extracted from it constantly, in a high temperature—lie at the foundation of all health and police laws. Its exclusion from the body after the purposes of life have been served, and its removal to such a distance as no longer to contaminate the air he breathes, are almost equally essential to healthy existence. In our position, water is so near the surface of the earth (say from two feet to six inches), dependent upon

* Report General Board of Health of England.
† Report General Board of Health of England.

the amount of rain that has recently fallen, in digging a pit to receive it, water rises, and the surface of the night soil is always near the surface of the earth, offending the olfactories and vitiating the air, situated, as it usually is, in the *least ventilated* part of our premises. It is proposed, then, that privies be built above, or partly above the surface of the ground, in cemented brick work and proper water closets, with the curved tube, rendering it impossible for any gas to escape from them. From near the top of this pit is a tube or pipe, at whose exit is a strainer, to the street drain, admitting only the liquid part. It thus becomes mixed with the water *constantly passing* through the streets, and is at once conveyed away and its impurities destroyed and sunk in the larger body of water with which it is mixed (one part to two hundred parts of *water being found to neutralize all its impurities.*)* Where this is not effected—or in the condition in which the privies are now throughout the city—immediate steps should be taken that every chamber or pit containing night soil should be rendered air-tight, and *connected by a ventilator* (a tube of an inch in diameter will suffice) *to the kitchen chimney;* and as there is almost always a fire there, and consequent upward draft, the gas would either be decomposed by the high temperature or carried so high in the atmosphere as not again to descend. When the pits become full, they should be emptied, and whenever this takes place, deodorizing substances should always be used, and probably the aqueous solution of the chloride of zinc is the best. As some families are disposed to neglect this important duty, to the great annoyance of their neighbors, it is recommended that the *vidangeurs* be licensed here, as elsewhere, under special instructions from the Health Department: † that no privy be emptied but by its cognizance, and that period be recorded in a book kept for that special purpose, stating the street, house, &c., so that it may be known to this Department who neglects that important duty. All should be thoroughly emptied and deodorized in May and June. An inspection of the records will show who is delinquent.

How remedied.

If not water closets, remove gas through the chimneys.

Swamps and Drains.—Running water in the streets absorb the vitiated gases, removes the lighter filth, dilutes the worse and

* By actual experiment. † Without cost.

refreshes the atmosphere. The larger drains should be covered, for reasons stated in a preceding page, thus having all the advantage of underground sewers. A full and perfect drainage is of great importance to the city. To the extent it has already been carried, it will have accomplished much good for our *future*, when it shall have been perfected in the manner stated. It has already materially lowered the line of former invariable level of water. The valuable space gained has been large. It has been found the invariable result of the extension of drainage in other cities that the portions so drained and those paved have greatly improved in health, in proportion to their proper extension, and that drainage alone vastly improves the entire neighborhood.

Effect of running water through the streets.

The swamps in the neighborhood must be effectively drained, and that hot-bed of pestilence removed, and the distinction is really very small whether one dies of yellow fever or any other disease of the zymotic class—intermittent, bilious fever or bowel complaints. These, and particularly the first, have greatly increased since the last eight years, during which the imperfect system of drainage and clearing has been progressing in the rear. No! The drainage must be *at first, thorough and complete* :—the forest-growth may then be removed with safety, when a new under growth shall have sprung up out of the recent marsh, to protect the otherwise exposed soil.

Swamps to be drained.

The inevitable ills resulting from the SIX CEMETERIES mentioned in a preceding section, can only be effectually remedied by forbidding further interments in them, and invite the proprietors for the sake of the living, to select a more appropriate and retired spot, more free from the encroachment of any future crowded habitations. The propriety of selecting a much more remote spot, will be the more apparent, when I mention, that a cemetery once occupied the very centre of the business mart of this great city, near and about the corner of Canal and Camp streets! and another where the present basin of the Canal Carondelet has been dug. Say, what would have been the consequences had *they* been continued? And yet we still have most of the present city cemeteries in comparatively central positions, in close proximity to large mercantile and crowded populations! Surely,

Cemeteries in the city closed.

our progress of extension is not to be arrested, by the injury liable to be sustained by the vicinage of corruption, or by awe of or regard for their lamented remains!

That the mortality is not greater immediately around them to the natives, (of which we are ignorant) may arise mainly of its consisting of an acclimated population, though *it must be* injurious to all, as materially aiding to impair the purity of the city atmosphere. (That it is highly injurious to the unacclimated—See Sanitary Map.) It is now a common sentiment, almost universally prevalent, that intermural internment, is injurious to health, and should be strictly forbidden by law.

Plenty of water of the best kind.

Pure Water and an abundance of it, are as essential to health as the air we breathe In this city the capacity for obtaining both is unlimited. The river water from the great length of the stream, has deposited most of the organic particles that shorter streams obtain from the washings of the earth by rains, and when its mineral admixtures are deposited by infiltration, it bears the reputation of being one of the finest waters in the world. Nevertheless, there is a general concurrence, ancient and modern, that water that has fallen in rural districts and percolated through a sandy soil and there collected, is the purest and best adapted to all the purposes of life. Rain water is known to contain an appreciable amount of iodine, and has a marked influence on affections of the urinary organs, on dyspeptic complaints and intestinal diseases. Nothing is more essential to health than pure water. Rain water when collected in the closely built parts of cities, not only collects the filth and soot off the roofs, and atmosphere, but the gaseous impurities with which the air is impregnated; and it has been demonstrated, that however long the rain has been falling, foreign ingredients will always be found in it. This water should be filtered as it comes from the roof through the gutters into the cistern, by passing through a bed of charcoal, and its power of absorbing atmospheric impurities and a nidus for musquetoes checked by having a float of wood on the surface of the water in the cisterns. If, notwithstanding all these precautions, animalculæ should be found in it, and the liabili-

Water how impaired.

How purified.

ty of being a breeding place for musquetoes, as all stagnant waters are, may be obviated by placing small fish in the cistern. The presence of animalculæ in large numbers, and it is believed that few cisterns are without them, indicates the existence of animal and vegetable matter usually in a state of decomposition, which invariably acts injuriously, if the water containing them, is used largely for the purposes of food, and the effects will be the more immediate and marked when the animalculæ are large and numerous. The German naturalist Ehrenburg, as the result of very extended observation, established the fact that the existence of visible animalculæ, generally indicates the presence of a lower series of invisible animalculæ descending in magnitude to the smallest monad of the most simple structure, so small that there is probably no smaller organized creature on which it can feed, which as is commonly conceived, by arresting organized matter on the very limit of the organic world, and converting it into its own nutriment, it furnishes in its turn, sustenance to higher orders of animalcular life.*

Town water is town air.

The above high authority then states it as an aphorism that those who drink water which has stood for some time exposed in a town, *drink town air*, whilst they who drink water brought direct from an elevated rural district, without such exposure, are *drinking country air!* All this is easily understood, and the water in our hydrants is liable to the same objections, so far as exposure on the water works mound makes it so, although it is not as much so as the cisterns in our back yards, exposed to the contamination of every vitiation there arising, and the more so, if in the thickly built parts of our city.

But water is not only demanded as a necessary of life, for its own purity, but is required for purifying our clothes, houses, yards, streets, and it is utterly impossible to keep anything in a cleanly and healthy state without its abundant supply for all these important purposes. For these reasons, the water works should belong to the city, and every house that is built should *compulsorily* (by city enactment) be supplied with it.

From the peculiarity of our climate and position the sani-

* Report Annual Board of Health.

tary condition is so much influenced by the *structure of our dwellings* that no building should be erected without due surveillance of the authorities. This could not be reasonably objected to, as it is but an extension of that care for the *health* which is exercised for the *lives* of the citizens in causing buildings to be made sufficiently strong, and in the protection of *property*, providing against the combustible nature of materials in the thickly built parts of the city. The controlling the moisture and crowding are the great enemies we have to guard against. These are corrected by ventilation and space. Every floor should be raised *at least* six inches, and the higher the better, above the level of the crown of the street before the door, and have corresponding outlets, front and rear, for ventilation, always open.

Surveillance on buildings.

Houses should be so constructed as to enjoy most advantages from ventilation with such opening to Southern quarters as to have, if possible, the advantages of the drying and enlivening powers of the wind and sun in the yard, and when practicable, on streets at right angles from the river, so as to enjoy the refreshing and purifying influence of the currents of water. Of course, all houses cannot embrace *all* these advantages; we mention those which are best, and the principle on which based.

Direction of houses.

Not more than a *certain per centage of ground* should be used for buildings, so as to admit ventilation and light. From the high value of ground in cities men take advantage, consult only their own profit in the erection of buildings, the object being to realize most out of the space, by over crowding them with houses unfit for the residence of human beings, regardless alike of the propagation of disease and the increase of mortality. The safety of the community, (which is the supreme law) requires imperatively that such a selfish disregard of public rights and interests should cease.

Only a certain amount of ground to be built on.

The amount of *pure air* necessary for respiration has been before stated, and in the surveillance of buildings particular notice should be taken of the size of sleeping rooms corresponding to the number of occupants.

How dampness of stores removed.

It is recommended that the dampness of stores and storehouses, as well as dwellings, so common here, be removed by a free use of stoves; for dry goods, and many other articles, it would be invaluable, and aid materially in the ventilation of *all rooms* for *every purpose*, *chimney flues* for draughts should be made in *every room*.

Why certain buildings not to be in thickly built places.

No hospitals, jails, poor-houses, asylums, or buildings liable to be much crowded, should be permitted in the thickly built parts of the city, either to impair the purity of the air, or be injured by its impurity, but removed to the neighborhood, where their inmates can enjoy the advantages of a free ventilation.

I cannot close this part of our subject, of the local causes and remedies for our insalubrity, without referring, as a faithful historian, although most briefly, to the influence of social habits on yellow fever, and especially, during its epidemic prevalence, as it is the result of my now very lengthened experience in it, that no cause is equally influential.

Influence of social habits.

Civilization, which has so much lengthened the catalogue of human ills, is—in this instance—to be debited, either truly or falsely on the balance sheet, with not a few of the moral and physical ills with which society is burthened. Drinking, as a social habit, barely dates back beyond two centuries. In a hot climate its destructive influence has been found cotemporaneous with the habit, acting in a line with all its injurious influences. The triumphs of temperance, and the disastrous effects of over indulgence in this debasing vice, were never more conspicuous and lamentable than during our terrible visitation last summer and fall.

Effect of intemperance.

During the whole course of the sitting of the Sanitary Commission, as a court of inquiry into the causes of the epidemic, and its great mortality, the inquiry was usually made of those we examined, of the influence of social habits, (intemperance,) upon the liability to the disease, and on its results. The answer was almost uniformly, that it not only *increased the liability to attack, but greatly lessened the chances of recovery.* This is most singularly and impressively illustrated, by the record I have received from the "Sons of Temperance," showing that of these about five hundred remained in the city during the epidemic, of which, only SEVEN fell victims to it; the proportion being 1 in 71.42, or 1.40 per cent.; the mortality of the balance of the city, "of those who remained," under similar circumstances, being 1 in 15.43, or 6.48 per cent., or nearly five times as many. A more valuable commentary on the advantages to be derived from temperance here, during the most malignant fever this country has ever experienced, cannot be found in those annals of philanthropy. May its record long exist as a standing monument of its protection against pestilence, and speak, trumpet tongued, as a warning to the South, against its alliance with disease.*

Proportionate mortality.

The explanation of the cause of the value of temperance, is perfectly apparent to the dullest comprehension, for it is a truth that holds good in every climate, that in proportion to the healthy state of the digestive organs, which intemperance always injures, sooner or later, is the constitution enabled to resist the causes of disease, and to pass through it more safely when under its influence. This is eminently illustrated in those two most formidable diseases, yellow fever and cholera, whose throne and citadel are these important organs; and could the per centage be ascertained, of the exact difference in mortality, in cases where these organs were lessened in their power of vital resistance from intemperance, and where they were in their original integrity, it would form a most valuable argument in favor of temperance; especially in a hot climate, where it is so much

*In conference with contractors for various species of public works, as canaling, original or cleaning out; digging, or exposure of fresh earth in various ways; the difference in health and capacity for labor, in favor of those abstaining, and those indulging in ardent spirits, furnishes a triumph to the cause of temperance, that should cause its adoption everywhere more injurious than in others, that was ever furnished to the public.

During the existence of the yellow fever in *Vera Cruz*, in 1847, it was announced by me, (as Chief Health Officer,) that any man who went from a debauch into yellow fever DIED, no exception could be found to it; it is believed the announcement had a most salutary effect.

SECTION XI.

Comparison of New Orleans with other cities, and application of the subject—Penalty incurred by man congregating in cities—Highest class of disease in different climates produced by it—Proofs of high civilization—How extensive fires produce sickness—Effect of sanitary measures in Louisville, Norfolk, Wilmington, Charleston, Savannah, Mobile, &c.—Climatural parallel with the Southern cities—Value of the Mississippi River as a scavenger, &c.—The delusive cleanliness of cities on a sandy foundation—Vera Cruz; its mortality, civil and military, under Mexican, contrasted with that under American domination—Triumph of sanitary measures.

Foundation of all sanitary laws.

There is no more convincing argument, or more satisfactory proof of the positions taken, and the principles laid down in this Report, than by reference to what has been done by our sister cities on this continent. The illustrations from abroad, of the value of sanitary regulations, personal and general, are coeval with our race; indeed, ever since man congregated in cities. Disease is the result of the transgression of the natural laws; *these laws must be understood, to be complied with.* The organism of man should act harmoniously with the laws of matter. In a state of nature, and in a congenial atmosphere, this is so. When the luxuries and refinements of life are carried to a high degree, man pays the penalty of his enjoyments, by a subtraction from his original stamina. It is by restoring these, and a removal of the impediments to their free exercise resulting from his congregating in cities, that constitutes the requisition and lays the foundation of all sanitary regulations. Man must forego the advantages flowing from this social aggregation, with its high cultivation of intellect, its advancement in scientific pursuits and the mechanic arts, and the greater refinement of intercourse and manners, and domestic comforts, or correct the inevitable evils of crowding, filth, bad ventilation, and the predominance of vice, or pay the penalty in greater brevity of life, and the multiplication of human infirmities. This penalty is very sure, varying from twenty to forty per cent., or more, between urban and rural districts, that is, between the use and abuse of sanitary laws. This great mortality is usually embraced in that class of maladies, denominated by Dr. Farr (who first introduced the term) zymotic, consisting of the class of diseases of epidemic, endemic, and contagious qualities. These differ in intensity in proportion to the concentration of the cause, varying in grade from the mildest ailment up to a disease of ferocious malignity, differing in type and name according to climate; having for its head in the North the typhus gravior of authors; in the East, the plague; and in the West, the yellow fever, as crowning monarch of the whole, exhibiting the result of the greatest intensity or concentration of causes producing them, respectively. These are not mere speculative opinions, they are the result of years, if not of ages, of experience, corroborated by the product of daily and hourly observation. When duly considered and properly appreciated, it is the wisdom of the present gathering the fruit of knowledge from the lessons of the past. High civilization and a proper estimate put on human life, is known by the enlightened application of these principles. The prosperity of communities, the health and happiness of individuals, and the moral standing of societies, in a great measure, depend upon them.

Penalty of congregating in cities.

It is wisdom from past experience

The best proof of this position is that by the application of sanitary laws—the duration of man's life has been materially increased, and diseases have been greatly lessened in number

Proofs.

and especially in intensity in those countries in proportion to their application. Formerly the plague swept off millions, and returned either annually or every few years, it is estimated that but a few centuries ago, half the human race, then existing, fell its victims within a short period, while now it is limited to the dominions of the Turkish fatalist, who applies not these laws. In the early part of this century yellow fever devastated the Southwestern parts of Europe. It has yielded to the hand of improvement. Investigation in England, has laid bare the causes of typhus and the hand of amelioration is fast lessening its ills. In our own country, the application of these laws has almost entirely driven yellow fever from the North of Charleston, and there it occurs but rarely and greatly lessened in malignity, and the thorough understanding and application of them will drive it to regions where they are entirely neglected.

The effect of the application of sanitary measures in improving the salubrity of a city have been mostly anticipated, in the preceding part of this report, the skepticism existing here, the vital importance of the subject and the ignorance of the fact (the improvement, whenever it has taken place, being attributed to other causes) will excuse our dwelling a little longer on them, in their illustrative application.

The filthy parts of cities alone subject to yellow fever.

It has been before stated that our Northern cities were formerly as subject to yellow fever as New Orleans, and that at least one of them has suffered as much or more from it than this city, without excepting the late extraordinary outbreak, that in each of those cities it was *confined to a locality*, more or less extended—that these were *proverbially the most filthy parts of those cities*, that these cities have special sanitary liabilities varying from difference of elevation and drainage, which we have not, that these portions have *always* been exempt from yellow fever, that they have been healthy since they have extended their pavements and been secured, that they all have constantly a careful police, and that water has extended throughout their limits, and that they have never been without an intelligent and vigilant health department, that to these causes are justly attributed by the intelligent and observing of their own people, the immunity they enjoy from yellow fever, that the late apparent exception in the case of the bark Mandarin, at Philadelphia, last summer, is in entire accordance with what has been stated, for it was well ascertained by me when there, that the first cases of yellow fever did not originate from that vessel, nor did any of her crew take the disease, but it arose from the negligent police of the neighborhood, especially made so by being the outlet of two half emptied sewers, that this disease was confined to very narrow limits, that it was constantly visited by persons from a purer atmosphere without extending the disease, that in this immediate neighborhood, there had been an extensive fire, a few years ago, and the houses had been rebuilt and improved, and that although in contact, as it were, with this "infected neighborhood," but two cases occurred out of 170 known to have taken it. Fires here like those in London and Hamburg, and every where, if followed by better buildings, have had a fine effect on the sanitary condition of the locality. But when they have not been so followed or a summer had intervened, they have become plague spots, from exposing their cellars, privies and filth of all kinds, and their collections to sun and rain, which have been verified from the fires in Charleston, Savannah, Wilmington, being one of the probable, if not main causes of several severe epidemics in those cities, so well is this understood among them, that fevers have been predicted from this cause alone.

These views will be strengthened as we come South. The city of *Louisville* was formerly subject to annual bilious fevers of great intensity, she was in fact, once called the "Graveyard of the West," being subject to bilious fevers, rivaling yellow fever in malignity, and which threatened to depopulate the town. In 1822, it amounted to 4.64 per cent. In some families nineteen out of twenty were sick at the same time; some families were entirely cut off. There was then but one street paved, and at least eight ponds within the town limits. By draining, paving, and a suitable police, it now

In Louisville.

Effect of paving and draning.

enjoys a salubrity equal if not superior to any large town in the West.

Norfolk.

Norfolk was once one of the sickliest cities on the sea-board, and frequently subject to yellow fever. By draining, paving, and filling up her low lots, the collecting reservoir of humid filth of all kinds, she has ultimately become entirely salubrious. From a letter from Dr. Upshur, with which I have been favored, I quote freely. He says: "Many years ago, miasmatic fever was a very common disease in Norfolk, during the autumnal months. *No case, however, originated in the paved parts of the town.* Within the last five years a vast amount of paving has been done, and we now have very little intermittent or remittent fever. Indeed, our sanitary condition has improved *pari passu* with the *paving of streets, filling up of lots*, and increased attention to the cleanliness of our streets, and other sanitary regulations; so that from having been the most unhealthy of the Southern parts, our city has of late become a proverb for its healthiness. Our mortality averages only twenty per month, out of a population of sixteen thousand," which is only one and a half per cent. or, fifteen in a thousand, which, if true, exceeds that of any town of its size, either on the sea-board or in the interior, and confessedly wrought from being one of the sickliest by *sanitary regulations.*

Paving and draining.

Wilmington.

Wilmington was once proverbial for her severe bilious fevers, and occasionally, yellow fever. She is situated on the banks of the Cape Fear river, (here fully half a mile wide with extensive marshes and low grounds beyond,) on sandy hills, having an argillaceous base, with a more or less admixture of an alluvial soil; springs issue from these hills, constituting slow, sluggish streams, with various stagnant ponds, receiving the drainage of the town, when it does not sink into the sandy soil of the place, it being thereby concealed from the public eye is probably, as injurious to the public health as if exposed, as in either case it only awaits the meteorological conditions to become actively noxious. In the former case the condition is

Delusion of a sandy soil.

worse, as it is deceptive, leading us blindfold to repose faith in a security that is delusive. This is particularly the case when the clay sub-soil is not distant, as in Mobile, and other towns along our Gulf coast and on the Atlantic, to which the moist filth sinks, not so low, probably, as the line of invariable temperature of the latitude, and never too low to be acted on by a very hot summer.

Under this condition of things sporadic cases of yellow fever occurred nearly every year, and a bilious fever of a malignant grade; and finally, a severe epidemic yellow fever, in 1821, demanded the urgent attention of the citizens of the place, when the above condition was altered, pools filled up, culverts opened, filth removed, neighborhood cleared, and sanitary measures fully established, and with these have eventuated the re-establishment of excellent health.

Effect of drainage and clearing.

Charleston.—This city lies but a few feet above high water mark of the bay before it, and is partly formed of made ground. This port has usually been found to be particularly unhealthy. It lies on a peninsula, almost surrounded by the rivers Cooper and Ashley, the neck cut up by creeks and ponds, and extensive swamps in the neighborhood. The ponds and creeks have been filled and drained; the low grounds and lots filled up, leveled, and thoroughly drained by underground sewers; a careful avoidance of disturbing the *original soil* of the streets, &c., during certain months, for gas, water, or other purposes; the constant study of her meteorological condition by her intelligent faculty, and the establishment and *enforcement* of sanitary regulations have had the effect of so improving her condition that from being one of the sickliest, she has become one of the healthiest cities in America. I quote from a recent report on the yellow fever of Charleston, by one of her oldest and most repectable physicians, (who has been her Port Physician and Chairman of her Boards of Health for near thirty years*): "In proof I say these plans have been progressively going on, and in proportion has the healthiness of the city been improved, and

In Charleston effect of drainage filling up.

No earth disturbance.

* Dr. T. Y Simons.

while the public authorities are gradual, nay, I may say, actively pursuing this plan, I firmly believe it will be the cause of making the city not only one of the healthiest among commercial cities, but may possibly *make us, in a great degree, if not entirely, exempt from yellow fever, and should it occur, lessen its virulence and mortality.* From long experience and observation, I regard it the solemn duty of the public authorities to go on with this plan, regardless of expense, not only for the preservation of health, but for the extension of commercial prosperity." These are valuable practical facts, the result of long years of experience, from high authority, (as most of us know personally,) and uttered in an enlightened city, where such advice will be appreciated.

Savannah.

The city of *Savannah* has been greatly improved by the exchange of the dry-culture for the wet in the extensive rice swamps in her neighborhood, and her mortality has been reduced *to about half* of what it was before.

Clearing and draining.

To the soil of Savannah the same objection is applicable as of Wilmington and others, it is mostly of a porous sandy nature, and all sorts of putrid debris become accumulated and incorporated with it, the offals of city life, and instead of pure sand or earth, which may have originally constituted the surface of the ground, a species of compost is formed and an active fermentation and decomposition is taken on, whenever there is heat and moisture enough to produce it, * this the true cause why she has heretofore been so sickly, although now so much improved.

Why a rainy season not always required for sickness where a sandy soil.

The verity of the explanation that has been given, in relation to the sickliness of sandy soils, is shown in the fact, that it does not always require a *continued* rainy season to evolve or produce the degree of humidity deemed essential for the development of fever. Rains in such a position may have fallen long before. This occurred at the Bay St. Louis during her disastrous epidemic fever of 1820, "the spring season was uncommonly wet and rainy—converting a large portion of this extensive plain

* Waring.

into a sort of temporary marsh, with standing water in many places covering considerable areas of land"—"the district is imperfectly drained by bayous, and in many places, during the wet season, the water stands in pools upon the surface until it disappears by absorption and evaporation,"—"the drought then continued thence from June to October."* Experiments with the hygrometer would have settled the point of the presence of moisture or not—that there was an abundance of water a few feet below this loose soil could have been easily enough shown; I have long essayed to procure the hygrometric condition of this neighborhood and of cities similarly situated, in vain. Assertion supplies the place of fact, an apparent condition takes place of the real one, and we have an additional false fact substituted for the truth, another stumbling block to the progress of medical science.

Parallel of New Orleans with other Southern cities.

In relation to all these Southern cities and towns it would be very instructive, were all the materials at hand to run a parallel between them and New Orleans. Their meteorological conditions have many marks of similarity. Our winter temperature is not so low, our summer temperature not higher: our enhanced hygrometrical condition is more or less in excess, *but it is more under control*, for our swamps are more susceptible of drainage: the precipitation here is somewhat greater, but then it is in our power, in part, to correct this, not only in relation to its amount, but to hasten its discharge in neighboring reservoirs. It cannot become absorbed here and thus retained as it is with them. Underground sewerage and thorough surface drainage then can probably do more for New Orleans that it can for them. ALL THE FILTH that collects in and about New Orleans can be removed by these and other means, for we have only to throw it upon the surface of the *great and unequal scavenger*, which a kind Providence has mercifully offered us and which we so blindly refuse to use, (to the extent we should) to wit: the mighty river before our door, while the above cities have but three or four feet of tide and but a few feet elevation above it, giving

All our filth can be removed.

* Dr. Merrill.

and *returning* the mixture, but rendered worse by the addition, or to sink into their absorbent soils to return upon them as a concentrated poison, at uncertain periods, when the other requisite—the meteorological condition shall occur.

Let us do justice en passant, to our noble river: a wide pervading influence for evil has been attributed to our great benefactor—that resistless stream so pregnant with blessings to us when managed rightly,—be the credit then where it is due. It is well known and admitted that all sluggish streams in hot climates, even those that admit of a moderate tide of two, three or four feet, by uncovering its banks, bars or islands pregnant with organic remains are highly injurious to health. The *Mississippi has none of these attributes*, it is a deep stream (of 100 to 150 feet) throughout its passage in Louisiana,—it is a rapid stream (of from two to five miles per hour) always productive of a salubrious ventilation, and when low, uncovering mainly sand-bars *within its banks*,—it has little or no organic matter in it; and hence its overflows required for the cultivation of rice would not be so injurious as other streams which are different. The offensive materials on its banks opposite the city is derived from the shipping and the city refuse. For these reasons probably fewer rural districts in our country are more salubrious than those situated immediately on its banks with the swamps at a distance covered and protected, so different from the sluggish tide water streams throughout our country, on few of which can the autumnal season be passed in safety.

Attributes of the Mississippi river.

Cause of the salubrity of the rural districts.

The comparison of *Mobile* with New Orleans in relation to their hygrometrical condition I cannot make, because that of our sister city has not been made by her scientific men; but, excepting her Western quarter, she has as much to increase or to give intensity to that worst condition as New Orleans. Her average annual precipitation is larger by more than *four inches* than ours, (years 1840, '48.)* If her streets are comparatively dry and clean on the surface, it is but to deceive one, a sandy soil with a substratum of clay, not far distant, only conceals that which with

Mobile.

Probable humidity.

* North—N. O. Journal, 1851.

us can be washed off, and deludes with a semblance of cleanliness without the reality, while the *festering poison only awaits the meteorological condition to lend it wings and give it virulence.* That such is the fact is rendered probable from the circumstances, the explanation given, the rationale and the results, and is fully justified from what we find to be the case in other countries similarly located. I need only refer here, in illustration and corroboration, to the malignant fevers of Walcheren, whose situation is much like it. The fevers of Pensacola, of Bay St. Louis, of Galveston, of Vera Cruz, are thus mainly accounted for, all of which clearly demonstrates, *that there is no substitute for an impermeable pavement in a hot climate.*

Only apparently clean.

Proofs elsewhere.

The distinguished Dr. Fordyce seems also to have been of the same opinion. In his fourth dissertation, he refers to the "insidious and dangerous character of these sandy soils. Perfectly dry and being clear from wood, with water only a foot or two from the surface, so destructive to the British army on a sandy plain in Flanders, and again to a region in Peru where water is every where to be found at about seventeen inches below the surface of the earth, although the country is itself barren for want of water, and uninhabitable from the number of dysenteries and semitertians that take place in it."

In Flanders.

Vera Cruz is another instance in the midst of the yellow fever zone, still more unfavorably situated than any that has been mentioned, and proverbial for its pestilential climate, that I have some scruple in referring to. For several reasons I am urged to do so, however, by my colleagues, as furnishing a great and direct triumph to sanitary measures.

Vera Cruz.

Triumph of sanitary measures.

From the extent and fatality of the *vomito* here and the seizure and occupation of it by the American army, being in the very nick of time for its devastations, it was fondly calculated in Mexico and extensively believed in Europe, that here the American troops would meet a worse enemy in the climate, than in the army of our foe.

The position of Vera Cruz is peculiar, it is situated on the Western shore of the Gulf of Mexico, in latitude 19° 15' North, on a sandy plain, elevated about five feet above the level of the sea, in the rear of the city are sand hills varying in height from twenty to forty feet, and distant from 10 to 1500 yards, between

Description of city and its neighborhood

these and the city during the rainy season are large pools of standing water, extensive marshes extend to the Southwest, covered more or less with mangles and other brush wood, with numerous small lakes or ponds, these empty into the sea along the South wall of the city and are the principal means of furnishing water to the mass of the inhabitants, and is largely influential in the production of the insalubrity of the place and have been complained of for centuries. The city is paved with coral rock obtained from the sea. It is surrounded with a high wall (about fifteen feet) so greatly interrupting ventilation, that as Chief Health Officer of the place in 1847, I strongly advised its being pulled down as it faced the sea, or to windward. The streets were formerly kept very filthy, and the place very badly supplied with water either for domestic use or cleanliness. Such was its condition when taken possession of by the American army under Gen. Scott, in March, 1847.

In order to make the comparison as just as possible, between the *Mexican and American regimê*, the periods under consideration shall be as approximative as possible, that is, immediately succeeding each other; hence, for the Mexican, I take the years 1845–'46 and the two first months of 1847. The civil and military I am fortunately enabled to seperate, and they are both derived from *official sources.* For the American, I commence after but two months of possession, when the greatest mortality incident to the recent conflict, was in some degree abated, although this continued large throughout the season, resulting partly from this cause and partly from the hospitals of the place being made the general hospital of the army invading Mexico, and hence was greatly increased from this cause, and from the large number of camp followers and retainers and others carried there, in part by curiosity, and the period embraced in the comparison comprehends *only the most sickly months* in the year on the part of the Americans. The civil and military mortality are also separate and are all derived from *official sources.*

PER CENT.

The ratio of the mortality of the *Mexican civil* population during the years 1845–'46 was.............. 6.28 Civil mortality, and military during Mexican regime.

The ratio of their *military mortality* for the years 1844–'5–'6 and part of 1847 was ascertained, but the amount of the force was not clear, it is put at somewhat less than it was found in 1847, which is probably one-third too much. The ratio of mortality to the strength assumed, is.................................. 13.90

The ratio of total mortality to total cases admitted into their hospitals is.......................... 19.49

The ratio of mortality, of the *diseases of the skin*, which were very numerous *were omitted*, would be.... 25.70

The proportion of deaths by *yellow fever* to the whole cases admitted were.......................... 85.23

And the proportion dying of yellow fever to the estimated strength was.......................... 7.95

The total mortality in Vera Cruz, in 1847, during the American regime, embracing only the *five sickly months* from first May to first October, of the *civil population*, including *strangers and foreigners* of every kind, not officially attached to the army, was (by official returns to me) according to the estimated population, and consisting too, mostly of the most reckless people on the face of the earth, and comparatively few acclimated, to 3.52 Do. of each during American regime.

The mortality of *the military* during the same period, embracing soldiers, quarter-master's men and all attachés of the army, including those left in the hospital on the departure of the army for the interior (a very large number,) the men sent from that army from time to time, to the general hospital at Vera Cruz, the army consisting mostly of undisciplined soldiers, unaccustomed to the climate, was.................................... 4.46

One-third of this, or 33.18 per cent. consisted of yellow fever.

The mortality of the first infantry, embraced in the above, is entitled to a separate consideration:—it garrisoned the city the whole summer, and is a fair comparison with the mortality among the Mexican soldiery. The aggregate force was 2,047, and the aggregate mortality 74, or.. 3.61

(Inclusive of a proportionate mortality by yellow fever of 14.80 per cent.)

Let us analyze this statement a little more in detail.

It appears then that the average mortality of the *civil population* at Vera Cruz, (during, of course, the *Mexican regimé*) amounted in the years 1845–'6, to........... 6.28

While the *same population* under the *American regimé*, in 1847, compared, not of settled citizens acclimated measurably to the soil exclusively, as before; but of these, and incorporated with them all that large class of reckless camp-followers of a victorious army, with all their dissipated habits, amounted to......................... 3.42

The mortality of the civil population about one-half, and of the military about one-fourth during the American in comparison with the Mexican regime.

And that the mortality among the *Mexican military* at the same place, during the years 1844–'5–'6 and part 1847, amounted to................................. 13.90

And the mortality to *cases*....................... 25.70

Of which the vomito or yellow fever, constituted of it. 85.23

While among *our military*, including attachés of the army of every grade, the mortality amounted to....... 4.46

While in the First Infantry (military alone) amounted to but... 3.61

The bare statement of the foregoing valuable facts, is its own best commentary: it is furnished as an instance of *the influence of sanitary measures in a hot climate, on unacclimated people*, even under the influence of peculiarly unfavorable circumstances.

After the lengthy recommendations given of sanitary measures in the preceding pages, it would be little more than repetition to say more than that these views were carried out with military precision, and that it consisted in the strictest policeing, rigidly enforced, at the earliest hour, and the strictest temperance advised; tropical fruit, and particularly if unripe, forbidden. The city was divided into districts, and responsible agents and physicians appointed to each, and required to report to the Board, at short intervals, the state of each, together with the number and character of the diseases occurring.

SECTION XII.

Resumé.—We shall now bring this Report to its close with the following Recapitulatory Propositions and Corollaries.

1st. That the insalubrity of New Orleans, which has now continued for so many years—with some remarkable exceptions—is not natural to her, or *necessarily* incidental to her position; that it is the cause of the high price of everything, and the direct means of retarding her progress to prosperity, and which will continue to exist until effective measures are taken to remove it.

New Orleans not sickly, per se.

2d. That the direct and *inevitable* change of *climate alone*, is not the sole cause of the mortality of immigrants, but the union of the climatic with the terrene conditions under *different circumstances*, were the efficient agents in the destructive influence on each class of people as pointed out according to nativity; that man cannot become acclimated to the second cause, or terrene (filth, &c.) any where, and that the acclimation to our first cause (or atmospheric) would be trifling, if the conditions constituting it, were so modified, as was clearly shown to be, in our power.

Mortality not owing to want of acclimation.

Can't acclimate to filth.

3d. We have endeavored to prove what were the constituents of the epidemic yellow fever of 1853, that they consisted of certain atmospheric and terrene combinations; that these causes, so far as we had the means of ascertaining, were confined to the limits of the fever district; that it began with these causes and ended with them, throughout the limits of the epidemic region, and that when these ceased, so terminated its influence on man.

Epidemic constituents.

4th. That one of these causes, (the atmospheric,) is more or less present here every summer, and that when the second (or terrene) exists in sufficient amount, an *epidemic* is the certain

The efficient cause of all our epidemics.

result, so far as near sixty year's experience will go to prove it; that this terrene condition is mainly composed of extensive disturbances, or upturning and exposure of the original soil of the country; that without this there has been no such *epidemic*, although, between the occurrence of some of them, long periods have elapsed; and that its ravages or malignity appears to have been pretty much in proportion to the extent of that disturbance.

Epidemic not importable or contagious.

5th. That for the existence of an *epidemic*, a wide pervading atmospheric cause being one of the essential elements, an *epidemic disease cannot be imported*, and that as a contagious disease cannot depend upon a *general cause* for its existence, but must derive its qualities from a specific one; epidemic yellow fever is consequently not a contagious disease.

Requirements for an endemic.

6th.—That to constitute an *endemic yellow fever*, the difference of which from an epidemic was fully pointed out, that the *apparent contagion* was only the extension of the epidemic principle, a lesser degree of the same, or what was believed to be equivalent, (filth of all kinds, and decomposing materials) with a lesser degree or intensity of the first or atmospheric constituent, were essential.

A lesser am't required for periodic fevers.

7th.—That when these causes did not exist in a sufficiently high degree to produce *yellow fever*, intermittent, remittent bilious, or other periodic fevers were the result, demonstrating by the clearest analogy that they proceeded from the same cause, and that they differed only in degree and intensity, a major amount of the very same materials being required to produce yellow fever, as a minor one does for bilious or periodic fevers.

Local causes and local effects.

8th.—That all these fevers are produced from *local causes*, more or less extensive, and that the fevers, the result of these, were limited to these bounds, that these causes are well understood, and were extensively pointed out in detail, that wherever the epidemic *extended*, there were *causes to localise it*, that where these did not exist, the cases of the epidemic *conveyed there did not extend*, and that consequently, that all these fevers arising from bad air, are no more contagious or infections the one than the other, the liability to them is limited to the bad or infected air and personal susceptibility; and finally, that these are *of the greatest importance in their practical bearing on sanitary measures.* And,

9th.—That the temporary epidemic cholera which occurred here early in December, it was shown, depended also, upon two conditions, an atmospheric and a terrene; that the first of these was different from that required to produce epidemic yellow fever, although the second was believed to be the same. Cause of epidemic cholera.

From all which the following corollaries were deduced; viz:

1st.—That an *epidemic yellow fever* in New Orleans, if produced by the causes stated in our third proposition, as believed, being known, is *controlable*, that is, PREVENTABLE. Epidemics controlable.

2d.—That an *endemic* yellow fever, arising from the same or equivalent causes, as above, although in a lesser degree, can also, be mainly, if not entirely controled. Do. of endemics.

3d.—That the causes of bilious or periodic fevers being known also, to arise from a smaller amount, or more diluted condition of the same circumstances, although more general and extensive, and more dependent on personal hygiene, it is in the power, as it is the duty of the civil authorities to mitigate, if they can not entirely control them; and finally: Do. of periodic fevers.

4th.—That it was demonstrated, that by the proper application of curative measures, by the establishment of proper sanitary laws and police ordinances, rigidly enforced and effectually carried out, New Orleans can be made as healthy as any city in America; and that it was not only the interest of the city to accomplish these important purposes,—but that— New Orleans can be made healthy.

5th.—A penalty could be as much *enforced upon the civil authorities for neglecting the removal of conditions subversive of health and life*, as *for any purpose* for which society was formed. Claims for legal enforcement.

Proofs and illustrations were furnished of the influence of sanitary regulations in various cities of the old world and on this continent, and what they had accomplished in removing causes of disease and restoring sickly cities to the enjoyment of salubrity.

Her prosperity alone depends upon health.

A comparison was instituted between New Orleans and other American cities, and particularly with Southern cities, with a running commentary on their comparative liabilities and immunities, and the important result was come to, that our city was far from being in an irreclaimable condition, and that she could compare favorably with any of them.

Intelligence synonymous with health.

It has been as truly as beautifully said, that intelligence is not only synonymous with moral power, but with health.* Health manifestly depends upon our observance of certain laws, which the Providence of God has entrusted for our guidance, which are recognized by all mankind and are instinctive. When these laws are broken, punishment (that is, disease,) inevitably follows, sooner or later; but it is in our power, as it is our duty, to comply with them, and exert the faculties He has given us for our welfare. We can only know the future from the past; it is the part of wisdom to know that like causes produce like results, under similar circumstances. The constant recurrence of yellow fever in the epidemic form, whenever there have been large disturbances of the soil, and *never otherwise*, in so long a period as SIXTY YEARS, and in proportion to that exposure, must be something more than a mere coincidence: it seems to the Reporter as well attested as any fact in history or science, as too intelligible to be misunderstood; invaluable as a warning, and the memento on that Chart as plain to us as "the handwriting on the wall" to the prophet of Israel. No less palpable, and as little to be disregarded, are the "plague spots" which have been demonstrated here, as in other cities, that here, in the midst of filth of all kinds, are the true birth places of disease, and it was equally clearly shown how much it was in our power to remove them, and that it was our duty and interest to do so, not merely on account of present prosperity, but even from a higher consideration, the promotion of the

The real cause of our fevers.

All cities improved by sanitary measures except New Orleans.

*Marx Willis.

great interests of religion. Our reputation abroad for salubrity is ruined, reform is now only left us. All cities, wherever situated, whether in the old world, the highly favored seats of renowned monarchs, covered with marble, drained and watered by works that are still the wonder and admiration of the world, or in the new, the selected marts of far enriching and enterprising commerce, have been subject to epidemics; which, like the monaxysinal diseases, the trials of infantile life, stand as tests of the constitution. Many quail and sink under the trial. New Orleans has stood many such trials; she is now at a crisis, and it will depend upon her people to say whether she shall recuperate or not. Her consulting faculty, (this Commission,) have pronounced her entirely susceptible of cure, *if their advice is followed*, otherwise not. A new era has manifestly sprung up, it is signalized by the appointment of this first Commission of inquiry into the real, not suppositious, condition of New Orleans. We look upon it as a proof that the great reformation so much needed, and without which no permanent prosperity is to be expected for this city, is about to commence; that the influence of sanitary measures is at last to be attempted, and we can not avoid the prediction, that it will eventuate as it has in all other places, in future prosperity and advancement. Nothing else is now wanting to repair the errors of the past, and it does no violence to probability to foretell from them the most brilliant future. If the Sanitary Commission shall not succeed in convincing their fellow-citizens of this, and that the same principles are applicable to our city as to all others, which is the true practical object of their appointment, then that appointment will have been superfluous. But, if we shall have shown by unmistakable facts, figures and argument, that we have nothing peculiar in our climate or position, but what is entirely accessible to amelioration and amendment by the hand of reform; that our city may be restored to salubrity; that her reputation for perennial pestilence shall be

The certain result of proper measures adopted here.

no longer applicable; that upon the broad foundation of SANITARY MEASURES we can erect a monument of public health, and, that if a beacon light is erected on its top, and *kept alive by proper attention*, our city will soon be second to none in this first of earthly blessings; the appointment will not have been made in vain.

SECTION XIII.

RECOMMENDATIONS.

We accordingly offer to the Council the following recommendations:

1st.—To adopt the system of *Sewerage*—the system approved of by the Sanitary Commission, as reported by our colleague, Prof. Riddell—embracing streams of running water constantly through the streets, from the river or otherwise, from March to November, during the *day* only. *Sewerage.*

2d.—The *drainage*, in the most complete manner, of the neighboring swamps and levees on Lake Pontchartrain, to keep out the Lake water. This is to be effected by machinery and *covered drains*, and these to be dug in the winter season. After this is fully effected, in the opinion of your Health Department— *Drainage.*

3d.—The *removal of the forest growth*, excepting for avenues and parks. *Forest growth*

4th.—The completion of the pavage of the city (removal of the round stone) by square blocks, united by cement, and the avenues may be (temporarily) by thick planks. *Paving.*

5th.—The purchase and extension of the Water Works to every portion of the city, with fountains in each of the public squares. *Waterworks.*

6th.—An *extensive shed* the entire front of the business part of the city. *Shed on river.*

7th.—To plant trees in all the public squares and principal streets. *Trees.*

8th.—To fill up *Gormley's Basin* and make a public square of it. Gormley's basin.

9th.—To make *covered drains* of Gormley's and Melpomene's Canals, and all the other drains of the city. Covered drains.

10th.—That the *slaughter-houses* be removed to such distance from the city, and all *vacheries* and *livery stables* having over six animals, removed to squares having fifty population and ten dwellings. The same of soap and tallow chandleries, or other manufactories or pursuits that have a tendency, in the opinion of your Health Department, to impair the purity of the city atmosphere. Slaughter houses vacheries and Livery Stables.

11th.—The adoption of a *system of privies*, according with the recommendations in this Report. Privies.

12th.—To *discontinue interments* in the city limits. Cemeteries.

13th.—To prevent any but the most superficial disturbances of the soil of the city or neighborhood, from 1st May to 15th October. Disturbing soil

14th.—To establish a *Health Department* on the plan detailed in the next section. Health department.

15th.—To establish a quarantine station, not nearer than eight miles from the city, as a branch of the Health Department. Quarantine.

16th.—To carry out fully the system of privies described in another section of this Report.

And finally; to order at an early day, a complete *Sanitary Survey* of the city before the warm weather sets in, under the instructions of the Health Department, of every house, lot and back yard in the city, to be most thorough and searching for every cause of disease, with plenary authority for that body immediately to abate it. To ascertain from every family the number that have not been vaccinated. Sanitary survey.

A book of record to be kept, wherein shall be recorded the reports from the Inpsectors of the special condition of every square in the city, with plans and diagrams, for present action and future reference, blanks being furnished by the Health Department, enumerating the duties and objects of the inspection. Book of record.

SECTION XIV.

Ordinance for the Establishment of a Health Department for the City of New Orleans.

Be it ordained by the Common Council of the City of New Orleans:

SECTION 1.—There is hereby created a Health Department for the City of New Orleans.

Health Department to consist of Three Physicians.

SECTION 2.—This Department shall be constituted by the appointment of the City Council, in Joint Session, of a Board of not less than three Physicians of the City of New Orleans, eminent for their services, experience and practical knowledge of sanitary laws and influences, who shall have resided in the city at least ten years, and whose term of service shall be five years.

President and his duties.

SECTION 3.—It shall be the duty of said Health Department to elect, on its first meeting, one of their number as presiding officer, who shall preside over its deliberations; be the organ of communication with this Council and the Public, and draw up the annual report.

Duties of said Health Department.

SECTION 4.—It shall be the duty of this Department to have surveillance and control, under the orders of this Council, over everything that may affect the salubrity of the city of New Orleans, or have a tendency to impair the same; to visit and inspect all hospitals and infirmaries for the reception of the sick; to see that they do not admit any contagious disease; that they are kept in a cleanly and not crowded condition, having not more than one patient to every one thousand feet of space. They shall visit and inspect, likewise, all Jails, Lock-ups, Asylums, Boarding, or other Houses, liable to suffer from overcrowding or filth; Manufactories, Livery Stables, Vacheries, Slaughter-houses, and any place which it has reason to believe there may be a nursery of filth, impairing the purity of the air. That the space allowed in lodging-houses for each individual shall not be less than six hundred cubic feet of space for each adult. To see that the cemeteries are in a proper condition, with the power of removal for neglect.

Penalty for obstructing Inspectors of Health Department.

SECTION 5.—All persons occupying houses for lodgers, or where the said Department may have sufficient reason to believe there may exist a breach of this Ordinance, are hereby forbidden to obstruct the examination of the same by themselves or their Inspectors, under a penalty of fifty dollars for the first offence, one hundred dollars for the second, and five hundred dollars for the third, or taking away the license. And this sum shall be sued for and recovered before any Court having competent jurisdiction, and the said amount recovered shall be accounted for in the expenditures for the support of the same, and it shall be the duty of the City Attorney to prosecute for the same.

SECTION 6.—This Department shall keep an office in some central building, to which shall be placed in their special care, all the mortuary records of the city of New Orleans, and shall appoint their own Secretary, which office shall remain open during the usual hours of business, and the books and records of said Department shall always be open to the inspection of the members of this Council.

Office and Records.

SECTION 7.—It shall be the duty of this Department to have prepared and keep blank books for the following purposes:

1st. One containing an accurate record of each and every burial in each of the several cemeteries appertaining to this city, in which shall be recorded the name, birth-place, sex, color, age, period and place of residence in this city, and the cause of death of every one buried in any of said cemeteries.

Book of Record for each branch of the Health Department.

2d. A book to record the weekly or other reports of the Dispensary and other physicians, (hereafter mentioned.)

3d. A book to record the daily and weekly statements of the Inspectors, (hereafter mentioned.)

4th. A book to record the reports and applications of all the vidangeries.

5th. A book to record the reports of those selected to make the sanitary survey, from time to time.

SECTION 8.—It shall be their duty to select and license the Inspectors or Health Wardens for the city, whose number shall not exceed nine, and who shall serve, under the instructions of said Department, and whose duty it shall be to point out and order to be abated anything that may, in the opinion of said Department, impair the salubrity of the city. They shall also, license all Undertakers, Vidangeries, Sextons, and no others shall be recognized or perform the duties appertaining to those several callings, without such license, under a penalty of two hundred dollars. And it shall be the duty of said appointees to obey all the lawful orders of said Health Department relating to their said duties. And, further, it shall not be lawful for any Sexton to bury or any Undertaker to convey any body from or into the city of New Orleans, without having previously received an order to that effect from the Health Department, under the aforesaid penalty; and for a second offence, to be liable to a penalty of double the amount, and to be deprived of their license.

Number of Inspectors or Wardens.

Duty of.

To license Undertakers, Sextons, Vidangeries.

Penalty and duty.

A permit fr'm Health Department to authorize a burial.

Penalty for infraction.

SECTION 9.—It shall be the duty of said Inspectors, in the Districts to be appropriated to them by this Department, to be constantly occupied in visiting their several Districts, and to give a written report of the condition of every house, backyard, privy, open lot, street, alley and building, mentioned in section four of this Ordinance, in writing, each week, under such

Duty of Inspector.

blank heads and instructions as the Health Department shall furnish.

SECTION 10.—It shall be the duty of said Health Department to cause to be rendered at the expense of the proprietor or occupant of any house or premises, where there shall exist any nuisance—and everything is denominated an *nuisance* that, in the opinion of said Department, shall impair the purity of the air of the city—within a delay not exceeding one day in summer, and six in winter.

Duty to have nuisances removed.

SECTION 11.—It is hereby ordained that every empty lot shall be filled six inches above the crown of the street within sixty days after this Ordinance shall take effect. And that no Cemetery within the thickly inhabited parts of the city shall any longer be the receptacle for the burial of the dead, after the 30th April, inst.

Empty lots to be filled.

Cemeteries disused.

SECTION 12.—It shall be the duty of the Vidangeries to have a permit from said Department previous to cleansing any privy, stating in their application, (which shall be duly filed and recorded in a book appropriated to it,) the number, location and proprietor of the house whose privy it is his intention to clean.

Duties of Vidangeries.

SECTION 13.—It is hereby made the duty of the physicians of this city, and of the families of all deceased persons, and attendants on such deceased, to give such information in relation to each deceased person as is required in section 7th of this Ordinance, under a penalty of fifty dollars, without which no burial certificate shall be issued, unless the Health Department is satisfied it *could not* be procured.

Cemetery certificates.

From whom.

SECTION 14.—This city is hereby divided into nine Wards, in each of which there shall be established a Dispensary, under the instructions and surveillance of the Health Department, where medicines shall be distributed to the poor gratuitously, on the certificate and prescription of the Dispensary Physician of said Ward, on his being satisfied of the inability of the sick to pay for the same, which certificate shall be duly recorded as a voucher for the same.

Districts nine, and on Dispensaries ,and Physicians to attend poor sick.

SECTION 15.—The City Council shall elect immediately, and hereafter, in the first week in January of each year, a physician, duly qualified by experience of at least five years in this city, of the diseases of the climate, of education, of which a diploma from some recognized, respectable Medical College, shall be required, and of good moral character, to each Dispensary District.

District Physician—appointment, qualification.

SECTION 16.—It shall be the duty of said Physicians to attend the poor of said Districts, respectively, gratuitously prescribing for them at the Dispensary, at some regularly

Duty of ditto.

appointed hour, and at their houses, when they shall be unable from disease to attend the said Dispensary; to vaccinate said poor, and to report the condition, as to salubrity, and of the character of the diseases prevailing, and a record of each case prescribed for, to the Health Department, in writing, weekly—in default of which the power of removal is hereby given to said Department, and temporary substitution, until his place shall be regularly filled by the Council.

SECTION 17.—The Health Department is hereby required to inspect the Quarantine Stations, which shall be considered but a branch of this Department, and advise with the Quarantine Physician on all subjects relating to his duty, and to see that the several officers attached to the Station perform in a proper manner, the duties required of them by law. And it is made the duty of the Quarantine Physician to report the condition of all vessels arriving at this port from any other port, as to cleanliness, and of the number and sanitary condition of her passengers and crew, and especially if any contagious, infectious, or febrile diseases shall be on board, and report. This shall be done (if the immediate advice or the action of the Health Department is required) at once: otherwise, weekly. It shall also be its duty to prepare from time to time, in conjunction with the Quarantine Physician, such rules and regulations as may be required for its government, subject to the approval of the Council.

To examine quarantine.

Report and duty of its Physician.

SECTION 18.—It shall be the duty of the Health Department, during the existence of any epidemic disease, to publish instructions to the public, succinctly embracing short advice on its prevention and treatment.

To publish advice during an epidemic.

SECTION 19.—It shall be the duty of said Health Department to keep a Meteorological Register, and record the temperature, barometer, winds, amount of rain and hygrometry of the atmosphere at least three times a day. To make and publish a weekly report of the number of interments in the city cemeteries, with such particulars in section seven as said Health Department may deem of interest to the public, with an abstract of the weather during the same period, and an Annual Report, with all the particulars bearing upon or appertaining to the salubrity of the city, with such suggestions for its improvement as it may recommend.

Meteorological record kept and published weekly, with Cemetery returns weekly.

Annual report

SECTION 20.—The compensation of the President of said Department shall be $3,000 per annum, and to each assistant $2,000 each; to the Secretary $1,200; and for office, stationery, blank books and blanks, and aid in organizing the office the first year, $2,000, or as much as may be required. To each Dispensary Physician $600 per annum; to the Inspectors, each

Compensation.

$500 per annum—to be paid monthly, on the order of the President of the said Department, and it shall be his duty to settle annually with the Comptroller the expenditures and receipts of his Department in January of each year.

Sanitary Survey.

SECTION 21.—It is hereby ordered that an immediate SANITARY SURVEY be made of the entire city, under the instructions of the said Health Department, who shall issue printed instructions to the Inspectors in blanks, and a plan of his District, and such other aid as they may require to facilitate it, embracing the following particulars, viz: The condition of every yard, whether paved or not, and how cleaned; the number, extent, and location of all lots that are below the level of the crown of the street; if supplied, and how, with water; the number of tenants and boarders in each house; the construction of each house—of wood or brick; the condition of the privies; the condition of every drain, canal and basin, and cemetery, and manufactory, slaughter-house, livery stable, and vachery, in each District; the condition of the levee and bank of the river and swamps contiguous to districts bordering thereon.

This inspection shall be recorded as the first in the Book of Record of Inspection, showing the exact condition of New Orleans on this foundation of a permanent Health Department for said city.

SECTION 22.—The Health Department is hereby authorized to furnish health certificates to the shipping, of the condition of the city, and to charge for the same $2 each to the domestic shipping, and to the foreign $5, and to account for the same in the annual settlement with the Comptroller.

SECTION XV.

Modes of Raising the Means necessary to Defray the Cost of the Recommendations.

No additional tax.

The large means required to carry out fully the views of the Sanitary Commission, and which is deemed requisite to restore this city to salubrity—to enable her fully to compete with any city of this Union, either in relation to health or the great purposes of commerce, we are fully sensible, she could not, at once, bear, under her ordinary resources, and it is farther obvious, that crippled as she has been, by the calamities of years, she cannot now sustain a heavier load of taxation than she is now laboring under. These, we fear, (if men submitted to) would farther tend to paralyse her recuperative energies, and put her beyond the possibility of competing with her more fortunate rivals.

It becomes our duty then, to point out some *extra means* beyond the ordinary resources of the city revenues, to accomplish objects in the highest degree urgent and important in themselves, and which we deem indispensible to her entire salubrity. Nor do we doubt could these objects be effected, she would be as healthy as any city in the Union. If some of these modes of raising this extra revenue are evils in themselves, they are certainly much less than those they will aid in effectually and permanently removing, and be of but a temporary character in themselves.

1st.—The city Council might reasonably expect from the fund derivable from the sale of swamp lands......$200,000 **Sale of swamp lands.**

2nd.—Three years ago a recommendation was made by the late *General Council of the city*, that an application should be made to the EIGHTEEN States directly interested in its salubrity, to induce them to unite in recommending to the General Government to transfer to this city 200,000 acres of public land, for which purpose it created a Board called "*The Permanent Sanitary Board*,"—whose duty it was made to initiate the necessary steps to obtain it. That Board organized and drew up a Report—in which the claims of New Orleans was set forth,—through which it was clearly demonstrated that *there had been expended* by this city and the State of Louisana for the actual and prospective population of these States not less than $2,000,000, and that it was morally and equitably right, that that sum ought to be considered due. The Report was approved of by the Board, but there required an outlay of some $200 or $300 for printing, &c., and as there was no sum appropriated nor could be procured, nothing far- **Public lands from the United States.**

ther could be done. The claim is deemed a *just* one, and if the proper steps were taken, a large sum could most probably be raised from it.

A reconstruction of that board is recommended, or its duties might be devolved upon the health department. As this will require time, no amount is put down as arising from this source.

McDonogh's bequest.

3d—The estate of the late John McDonogh, will have a contingent fund to be available after some years. It is believed that a considerable sum could be raised from this source; it could be used on the basis on which a sum could be obtained on credit, say.. $35.000

Tonnage duty.

4th—The President of the United States has advised, in his message to Congress, that a tonnage duty on all vessels visiting the several ports and harbors, be left at the disposal of the States respectively. This would be just, as enabling each to collect a large amount of money, required and received in proportion to the importance of the port, to be appropriated to the wants and requirements of these ports, to facilitate the various advancements and conveniences of commerce.

There would be a very large amount derivable from this prolific source, say only.....................$500.000

Loan from McDonogh's estate.

5th—The final adjudication, by the Supreme Court of the United States, of the large estate of Mr. Mc Donogh to the cities of New Orleans and Baltimore, leaves subject to the control of this city a large sum, which it has been proposed to invest in railroad stock. It is conceived that the *first* interest of New Orleans is its *salubrity;* all else should be considered subsidiary to this. Railroads are the *second* great duty of this city; but without health, they only make a great winter factorage of it. *With health*, railroads will make it second to no city on the continent. Its salubrity, and *its reputation for salubrity*, must *precede it, now its reputation is gone.*

The amount to be derived from this source is very large, say....................................$400.000

6th—A special tax on the property of absentees is not constitutional, but some means should be devised by which to apportion, somewhat more equitably than is now done, the various incumbrances of civil government—the benefits and burthens; and particularly during epidemics. these latter are very onerous on those who remain to discharge faithfully their duties to society.

The authorization to raise a certain sum by lottery to be solely appropriated to the removal of the causes influencing the salubrity of the city.

Here then is the enormous sum of...........$1.435.000 besides the contingencies that have not been estimated, but little more than half of which, would make New Orleans one of the healthiest cities on the continent, and one of the most desirable residences; put her in the front rank of American cities, and with her railroads, defy all competition.

A TABLE
OF THE
Deaths in New Orleans during the year 1853;
Showing for each Class of Diseases the total Mortality, and that of each Month;
ALSO, THE SEXES AND COLORS WITH THE AGES AND PLACES OF NATIVITY;
COMPILED FOR THE SANITARY COMMISSION BY D. MACGIBBON, M. D.

Monthly Mortality

DISEASES.			January	February	March	April	May	June	July	August	September	October	November	December
CLASS I. EPIDEMIC.														
Yellow Fever	7849		1				2	31	1521	5133	982	147	28	1
CLASS II. ENDEMIC.														
Cholera	585		25	3	2	11	9	14	5	4		6	177	332
Cholera Morbus	35		2	1							8		13	7
Cholera Infantum	75		5		2	5	15	6	8	5	9	4	7	9
Dysentery	232		17	10	8	13	22	25	30	16	14	29	35	13
Dysentery, Chronic	38		4	6	2	1	4	1					10	10
Diarrhoea	225		20	8	7	16	36	23	23	25	14	17	14	16
Diarrhoea, Chronic	42		3	3	2	2	7	1	5				11	8
Malignant Fever	34					6	10	12	6					
Pernicious Fever	152		4	4	1				18	54	52	16		3
Congestive Fever	77		5			3	3	11	19	25	9		2	
Remittent Fever	29		1	1		1		7	9	5	3	1		2
Intermittent Fever	38		2	2	3	2	5	2	6	10	1	1	2	2
Bilious Fever	21					3	5	7	2	3		1		
Typhus Fever	103		15	9	11	7	6	9	19	13		3	4	7
Typhoid Fever	146		13	7	5	17	12	8	10	21	24	7	8	13
Other Fevers	69		8	6	6	2	4	9	5	17	1	5	1	
Erysipelas	18			2	1	3	2		6	1	1	1		
Croup	35	1954	8	3	4		3	1		2	5	3	3	2
			133	65	51	89	144	166	1704	5338	1121	243	318	430
CLASS III. MONOXYSMAL.														
Pertussis	44		3		1	3	5	3	7	5		8	5	4
Measles	124		1	4	5	20	53	30	7	1	2	1		
Scarlatina	126		20	24	20	17	25	13	1	1	1	1		4
Variola	17	311	2	6		2	3	2		1	1			
CLASS IV. VARIABLE.														
Scrofula	17		2	1		2	4	3	1	1			2	1
Marasmus	100		5	3	7	1	13	7	10	11	9	14	11	9
Debility	213		8	6	3	22	43	26	22	30	13	15	11	14
Teething	141		3		5	12	24	12	11	15	17	14	15	13
Dropsy	84		9	9	3	4	8	2		10	12	13	5	9
Haemorrhage	16		1	1	2	2	1				6		2	1
Gangrene	24		1	2		1	3		1	1	5	6		
Cancer	10		2			2	1		1	3	1			
Abscess	9					1	2		4			1	1	
Non-Viable	13				1	6	3						2	1
Other Diseases	80		21	15	11	5	3	6	3	5	2	1	3	5
Not stated	1150	1855	100	66	78	20	27	57	113	345	115	83	85	61
CLASS V. NERVOUS.														
Apoplexy	127		10	11	6	13	7	10	21	17	8	4	8	12
Congestion of Brain	111		7	3	5	7	8	10	12	21	12	10	4	12
Cephalitis	134		5	3	4	8	9	10	18	35	27	4	6	5
Meningitis	61			4	1	12	5	6	7	10	7	1	5	3
Epilepsy	13			1			1	2	4	1	2	1		1
Hydrocephalus	21			2		3	3	4	2	1	3	1	2	3
Convulsions	465		22	16	22	38	42	53	44	107	39	26	30	26
Tetanus	49		3	5	2	2	8	2	3	3	6	5	5	5
Trismus Nascentium	144		10	9	6	8	8	5	14	13	25	15	15	16
Paralysis	15			1		1	4	1		1	2	1	1	3
Other Diseases	16	1161	3	4	3	3	1	2				1	1	
			60	59	49	95	96	105	135	209	131	69	77	86
CLASS VI. RESPIRATORY.														
Laryngitis	6		1	1	1	1	2							
Bronchitis	64		7	8	8	8	8	2	3	6	4	2	3	5
Pleurisy	10		3	1	1	1	1	1		1				1
Pleuro-Pneumonia	17		1	2	3	4	4					2		1
Pneumonia	167		21	23	27	27	11	11	5	10	8	8	5	11
Consumption	755		73	70	73	66	72	49	53	60	57	60	60	62
Catarrh	30			3	1	8	1	4		1	4	4		1
Asthma	7					1				1	2		1	2
Other Diseases	42	1098	3	2	7	7	3	6	2	5	1	3	2	1
			109	110	124	123	102	73	63	84	76	79	71	84
CLASS VII. CIRCULATORY.														
Pericarditis	9		2			3	2		1				1	
Organic Disease of Heart	19		3	5		1						4	2	4
Other Diseases of Heart	41	69		2	4	10	8	3	1	4	3	1	1	4
CLASS VIII. DIGESTIVE.														
Gastritis	35		4	3	3	8	6	4	3			1	3	
Gastro-Enteritis	97		4	3	4	15	6	6	10	9	7	13	6	14
Enteritis	139		7	8	8		12	17	19	28	13	6	7	8
Peritonitis	24		2	1	1	2	3		3	4	2	1	3	2
Cancer of Stomach	8		3	1		1	1	1	1					
Worms	19		2	1	1	3	2		3	4	2	1		
Colic	6			1			2	1	1	1				
Tabes Mesenterica	21						1	8	5	1		1	3	2
Ascites	20		2			1	2	4	4			4	3	
Other Diseases	27		3	5	6		1	3	2	1	3		2	1
Hepatitis	38		4	4	5	2	4	3	1	4	4	2	3	2
Cirrhosis	6					2		1	2		1			
Jaundice	4						1			1	1		1	
Other Diseases of Liver	12	450	1		2		2	6					1	
CLASS IX. URINARY.														
Urinary		4		1							1	2		
CLASS X. OF MALES.														
Of Males														
CLASS XI. OF FEMALES.														
Child Birth	20		1	1	5		1	1		4	3	1	3	
Puerperal Fever	15		2	1		2	2	2	1	1	2	1		1
Cancer of Womb	6		1				2		1	1		1		
Other Diseases	15	50			2	2	2	4	2			2	1	
CLASS XII. LOCOMOTIVE.														
Rheumatism		12			2	2	2	1		2	1		1	1
CLASS XIII. INTEGUMENTARY.														
Integumentary		7						2	2		1	1		1
CLASS XIV. OF SENSES.														
Of Senses														
CLASS XV.														
Old Age		53	6	7	1	1		3	5	1		9	9	11
CLASS XVI.														
Still Born		346	23	27	26	21	18	12	31	35	30	44	23	26
CLASS XVII. CASUALTIES.														
Casualties	61		7	5	3	2	2	1	3		11	7	5	15
Sun Stroke	21							9	7	5				
Drowned	105		5	6	4	6	13	10	13	15	6	9	8	10
Burns and Scalds	18					1	2	2		2	2	2	1	6
Hydrophobia	6	211			1					1	2			2
CLASS XVIII. EXOPATHIC.														
Poisoned	4		2					1				1		
Wounds	47	51	6	4	6	10	2	2	6	2	4	3		2
CLASS XIX. ESOPATHIC.														
Intemperance	123		9	5	8	7	9	11	11	13	15	8	12	9
Syphilis	6		1	1		1	1			1			1	
Suicide	14	140	1		1	2	2		2	1		2	3	
CLASS XX. TREATMENT.														
Treatment		3				1					1		1	
Total		15 633	581	613	456	562	671	656	2216	6201	1627	671	742	841

Sexes and Color; Ages

DISEASES.	Males (White)	Females (White)	Males (Colored)	Females (Colored)	Sex, but not color stated. M.	F.	Color, but not sex stated. White.	Colored.	Neither sex nor color stated.	Under one month.	Do. one year.	Do. five years.	Do. ten years.	Do. twenty years.	Do. thirty years.	Do. forty years.	Do. fifty years.	Do. sixty years.	Do. seventy years.	Do. eighty years.	Do. ninety years.	Do. one hundred years.	Above one hundred years.	Not stated.
Yellow Fever	5203	2475	17	21			37	5	1	7	90	196	197	1598	3310	1298	436	180	54	15	3			325
Cholera	324	157	51	48	1	2	1	1		1	28	85	30	61	149	101	39	22	8	2	3			56
Cholera Morbus	17	8	6	3				1		3	1	6	2	6	8									2
Cholera Infantum	28	27	7	9	1		1	2		9	33	19												14
Dysentery	136	75	15	4			2			4	33	34	8	19	48	31	23	14	1	2				15
Dysentery, Chronic	23	8	4	3						1	3	2		3	10	8	7							4
Diarrhoea	133	68	12	4			5	2	1	5	45	37	10	14	31	35	15	6	3	1	1			22
Diarrhoea, Chronic	23	11	6	2						1	4	6		2	5	8	4	1	1					5
Malignant Fever	21	6	5	4						1	7		2	9	9	2	1							2
Pernicious Fever	77	52	10	7			4			1	7	33	17	14	32	16	3	5	3	2	3			16
Congestive Fever	51	21	2	3							4	6	7	6	26	10	5	3						10
Remittent Fever	15	9	3	2							4	5	7	5	9	8	1							2
Intermittent Fever	27	7	2	1			1				5	5	1	6	8	6	3	1	1	1				2
Bilious Fever	16	5									1	1			7	5	3	1	1	1				1
Typhus Fever	55	43	3	2								7	14	18	12	6	3							14
Typhoid Fever	78	50	9	8							4	9	11	18	38	32	12	7	5					10
Other Fevers	38	25	3	3						1	9	11	5	2	16	12	2	1						9
Erysipelas	12	2	3	1						1	1			4	2	1	4	1						2
Croup	17	11	3	4						5	13	11	3											3
Pertussis	14	22	2	3			2	1			11	18	5	1	2									4
Measles	44	49	9	17			3	1	1	2	37	61	8	3	1									9
Scarlatina	41	58	9	12			3	2		4	18	59	26	6										7
Variola	9	3	1	2											2		2							5
Scrofula	8	1	3	4			1				1	5	2	2	2	1	1							3
Marasmus	41	41	7	8			1			8	40	30	6	1	2	3	1	2						7
Debility	93	84	12	15			5	4		37	16	23	3	4	4	11	1	7	15	6	2	2		43
Teething	66	54	10	9			2	2		9	75	58	1											7
Dropsy	34	27	9	12			2			2	10	4	1	11	15	14	7	9	3	2				6
Haemorrhage	9	2	4	1							1	1	2	6	1	1	2							2
Gangrene	15	1	2	1			1				1	3	6	2	2	1	3	1						1
Cancer	2		4	4										1	1	2	2	1	1					1
Abscess	6		2											2	2	2	1	1						1
Non-Viable	3	2	1	1	1		1	4		1	2													10
Other Diseases	36	26	7	5			2	2	2	13	11	5	2	4	8	11	12	2	2					10
Not stated	612	433	26	25		1	35	8	10	100	190	95	28	84	179	85	39	22	14	5	1			200
Apoplexy	77	25	12	18			1				2		1	3	22	22	23	13	10	7	6	1		17
Congestion of Brain	57	23	17	9			5			3	14	26	4	5	5	16	11	13	2	1				11
Cephalitis	62	43	10	7			10	2		7	37	38	4	9	7	10	5		3		1	2		10
Meningitis	24	20	12	5						3	8	29	8	3	3	3	1	1						2
Epilepsy	7	2	3	1								2	1	1	1	2	1	1	1					2
Hydrocephalus	13	8	1	1			1				8	11	1		1	1	1							1
Convulsions	216	167	25	21		2	20	12	2	98	141	128	19	11	9	3	2							54
Tetanus	21	15	4	4			2		1	2	5	4	5	6	6	4	2	1						17
Trismus Nascentium	56	42	8	9			19	8	2	144														
Paralysis	6	4	4	1									2	1	6	1		1		1				3
Other Diseases	1	5	2	7						2		3		3	3	2	2	1	2					
Laryngitis	1	3					2			1		3				1								1
Bronchitis	28	16	5	11			4				4	10		6	5	5	12	2	2	3				7
Pleurisy	7	1		2								1		1	3	4		2						1
Pleuro-Pneumonia	13	2	2									2	1		3	6	1	4						
Pneumonia	68	30	39	28			1	1		2	19	21	7	15	37	21	12	9	7	2				13
Consumption	372	206	80	89			4	4		4	21	44	16	62	238	154	77	44	12	3	1	1		78
Catarrh	12	2	6	10						4	10	4	4		1	1		1	2	1	1			1
Asthma	4	1		1			1								1		1		3	1	1			
Other Diseases	26	9	4	2			1			1	3	4	5	2	5	8	2	5	2					5
Pericarditis	7		1	1									3	1	1	3			1					
Organic Disease of Heart	7	2	4	3		1	1	3						1	1	3		1	1	1				6
Other Diseases of Heart	16	8	4	11		1		1	2	1	1	2	1	5	6	7	4	2	2	2				7
Gastritis	18	9	2	8							8	7			5	1	10	1		1				2
Gastro-Enteritis	36	36	12	12	1					7	13	3	3	5	7	10	13	6	3		1			11
Enteritis	56	45	15	15			2			5	31	31	5	6	11	7	7	5	5	1	1	3		15
Peritonitis	11	5	3	4	1						1	2	1	4	6	4	1							5
Cancer of Stomach	3	4		1										1	1	3		1	1					1
Worms	7	7		4		1					4	9	4							1				1
Colic	2	1	1	2						1						4	1							
Tabes Mesenterica	13	5	1	2							7	7	2	1		1			1					2
Ascites	13	2	2	3								3		2	3	2	4	1	1	2				2
Other Diseases	7	14	4	1			1			1	1	1	4	1	2	6	4	3	1	2	1			1
Hepatitis	22	11	4	1									2	2	1	6	9	6	4	1	1			6
Cirrhosis	5	1													1	3	2							
Jaundice	1	3									1				1	2								
Other Diseases of Liver	8	1	1	2								1		1	2	4	1		1					2
Urinary	3		1												1	1	1							1
Of Males																								
Child Birth		15		5										3	9	3								5
Puerperal Fever		14		1											7	6								2
Cancer of Womb		4		2										1		2	1	2						
Other Diseases		11		4										1	3	1	5							5
Rheumatism	5	6		1						1	1				2	1	2	2			1			2
Integumentary	3	1	3							2	1					1	2			1				1
Of Senses																								
Old Age	13	15	6	18		1										1	4	8	17	7	6	1		9
Still Born	102	73	18	11			102	24	13	346														
Casualties	44	5	9	3						4	3	1	2	5	7	16	9	3	2					9
Sun Stroke	16	4		1										1	8	6								1
Drowned	90	4	8	1		2				1	2	5	3	11	31	26	4	2						20
Burns and Scalds	5	6	2	5							2	2	2	1	4		1	1	1					4
Hydrophobia	2	4									1	1	1			2	1							
Poisoned	3	1													2									3
Wounds	31	7	6	1							2		4	2	5	16	3	1	1					13
Intemperance	91	20	8	4										5	31	37	19	10	7		1			10
Syphilis	3	3													1	4								2
Suicide	11	2		1							1	1		1	1	2	1		1					6
Treatment	1	2												1	1									1
Total	9140	4850	618	606	7	7	280	99	45	859	1095	1260	199	2085	1514	2070	801	416	206	84	40	18	1	135

Nativity

DISEASES.	New Orleans.	Louisiana, Mississippi, Alabama, Ga., S. Carolina, & Texas.	North Carolina, Virginia and Maryland.	North Western States.	Northern States.	British America.	Great Britain.	Ireland.	Germany.	France.	Holland and Belgium.	Austria, Poland, Prussia and Denmark.	Norway and Sweden.	Spain and Italy.	West Indies, Mexico and South America.	Not stated.	Total.
Yellow Fever	87	92	54	63	112	7	132	1842	1209	271	18		84		46	4	3855
Cholera	75	2	3	1	4	1	4	149	30	7				3	1	305	
Cholera Morbus								1	6			1	1	1		25	
Cholera Infantum	25	1						1	2							41	
Dysentery	32	1		3		2	7	29	15	1	3		2	2	1	129	
Dysentery, Chronic	4					1		12	3					1		18	
Diarrhoea	27	1		2		1	3	21	25	4	1	3		1	1	121	
Diarrhoea, Chronic	5					1	3	5	2	1						25	
Malignant Fever								8	4	1			1	1		18	
Pernicious Fever	9	2			2		3	3	12	6				2		113	
Congestive Fever	5	1	2	1			2	15	5	4	1	2				39	
Remittent Fever	2	1		1			2									15	
Intermittent Fever	5			1				3	4	1						10	
Bilious Fever	1						1		7	1	1					5	
Typhus Fever	4		1	1			2	4	34	7	6	1		1		32	
Typhoid Fever	7	2	4	1	3	1	4	32	12	6	2					83	
Other Fevers	8	1		1				12	6	1	1					18	
Erysipelas	2	1				1	1	2	1							10	
Croup	11															21	
Pertussis	8		1					2		1	1					32	
Measles	31	3		1				3	1	1	1					80	
Scarlatina	13	1					2	3							1	96	
Variola	2							3	1							11	
Scrofula	2	2		1				1	1							10	
Marasmus	34	1						4	2							57	
Debility	37	1	1	3	2		1	14	9	1	1					81	
Teething	59	3		1			1	1	1							79	
Dropsy	2	2			4			10	10	2				1		53	
Haemorrhage	3							2	2							9	
Gangrene	1	1			1				1							16	
Cancer	1							1	1							8	
Abscess	1							1	1							6	
Non-Viable	13																
Other Diseases	9	3	2		1			4	1	2				2		53	
Not stated	190	2	2	1	3	1	6	295	42	8	2	1	1	3	1	589	
Apoplexy	6	1		3	2	1	3	10	13	5	2		1	1	1	78	
Congestion of Brain	10				2		2	17	2	3						75	
Cephalitis	25	1	1		2		3	3	6	1		4				88	
Meningitis	5				2			3								51	
Epilepsy	2							2					1			8	
Hydrocephalus	10							1	1							12	
Convulsions	165	3	2	2	1		3	11	9	6	1			1	1	260	
Tetanus	11						1	7	4		1					25	
Trismus Nascentium	144																
Paralysis	1							4	2							8	
Other Diseases	2		1	2						1						12	
Laryngitis	2																
Bronchitis	6	1			2			4	3	3	1		1		1	42	
Pleurisy		1			1			2						1		5	
Pleuro-Pneumonia	1		1	1			1	3	1							9	
Pneumonia	19	1	1	2	1		1	15	4	2		1	1	1		115	
Consumption	44	8	17	11	19	3	15	121	44	17	5	5	4	9	1	427	
Catarrh	4								1				1			24	
Asthma		1					1		1							4	
Other Diseases	6	1		1			1	5	1	2		1		1	1	22	
Pericarditis		1						1					1			6	
Organic Disease of Heart	1		1													17	
Other Diseases of Heart	2			1			1	5	1	1					2	28	
Gastritis	3	1					1	5		1						24	
Gastro-Enteritis	6	1	2	1	1		2	5	3	3				1		72	
Enteritis	18	1	1		2			2	7							102	
Peritonitis	1							2				1	1			19	
Cancer of Stomach	1						1	3								3	
Worms	5				1			1	2							10	
Colic	1							1	2							2	
Tabes Mesenterica	4							2	2							13	
Ascites	2				1			1	1	1						14	
Other Diseases			3	1		1		1	2		1					18	
Hepatitis	2		1					7	3	2			1			22	
Cirrhosis					1							1				4	
Jaundice								3								1	
Other Diseases of Liver	1	1		1	1			1	2		2					3	
Urinary								1								3	
Of Males																	
Child Birth	2							8	3							7	
Puerperal Fever								3		2		1				9	
Cancer of Womb		1		1												4	
Other Diseases		1							1							13	
Rheumatism	1					1	1	1	2		1					5	
Integumentary	1	1														5	
Of Senses																	
Old Age	4						1	9	3		1				1	31	
Still Born	346																
Casualties	4	1			1	1		11	2	3						35	
Sun Stroke								7	5							9	
Drowned	3				2	1	1	7	2	2						87	
Burns and Scalds	3						1	2							1	11	
Hydrophobia								1	1							4	
Poisoned									1							3	
Wounds	2		1					19	5	1		2		1		25	
Intemperance	4		3	2	2		3	29	7	1	1	1		1	1	68	
Syphilis								1	1							4	
Suicide								1								13	
Treatment								1	1							1	
Total	1657	811	111	112	184	25	227	2867	1520	492	76	108	28	83	23	8050	15 633

TABLE G.

Monthly Returns from each of the Cemeteries.

1853.	Jan.	Feb.	Mar	A'ril	May	Ju'e	July	A'g.	Sep.	Oct.	o v	Dec	Total.
Cypress Grove No. 1........	24	28	23	36	31	34	43	151	53	25	18	14	480
No. 2, or Pottersfield........	61	56	53	55	73	56	139	1424	361	127	150	135	2690
Odd Fellows' Rest..........	2	4	5	7	..	11	13	52	14	7	4	2	121
St. Patrick's................	5	57	68	63	95	123	486	1038	262	86	127	102	2558
Charity Hospital............	89	67	85	69	72	94	604	917	227	184	122	108	2638
Lafayette, or 4th District...	92	69	84	82	121	137	469	1177	207	74	110	124	*2696
St. Vincent de Paul.........	89	86	79	82	146	104	224	1040	302	93	82	119	*2446
Hebrew, on the Ridge......	2	..	3	4	..	1	...	7	2	2	1	...	22
Hebrew, Lafayette.........	....		....	....	1	2	25	71	12	2	4	7	*124
Protestant..................	30	29	31	29	38	22	60	218	68	29	33	47	*633
St. Louis No. 1.............	17	23	18	27	18	14	20	67	39	33	22	35	*334
St. Louis No. 2.............	61	68	59	56	79	70	49	136	74	38	74	66	*830
Totals.................	518	487	508	510	676	668	2132	6298	1621	700	747	759	15572

* Those thus marked (*) are within the city limits, and amount to 7063.

EXPLANATION.

There are some discrepancies in the report in relation to the monthly mortalities—the monthly returns by the cemeteries—the aggregate mortality for the entire year, and number in the tabular return of yellow fever cases, with those from which I have made my calculations, which require notice.

For the first three, one explanation will suffice, for about *one-third* of the year was there an *authorized board* to record the number, and the cause of death—for the balance of tne year it has been difficult to get the cemetery returns and they do not correspond.

In relation to the number of deaths by yellow fever, many were stated as "unknown" "unspecified"—whose deaths were probably caused by yellow fever;—anxious to arrive as near the truth as possible, the Sanitary Commission has authorized me, during the epidemic, to add a large portion of these to the yellow fever mortality, which I have done in the daily returns in the tables C, D, E.

[TABLE N.]

Meteorology of New Orleans, for the Year 1853.

MONTHS.	Thermometer—Outside. Average at sunrise.	Average at 9, A. M.	Average at midday.	Average at 9, P. M.	General average.	Range.	Temperature of the Mississippi. Av'ge temperature of the river at 6 A. M. daily	Dew Point. Average at sunrise.	Average at midday.	Average at 9, P. M.	Aver'ge for the month.	Range.
January	44.22	48.20	53.90	49.00	47.00	37.30	47.24	42.36	45.50	46.95	44.93	28.2
February	50.10	56.14	63.03	54.03	56.05	40.30	42.68	48.24	50.72	52.80	50.48	36.4
March	55.83	63.45	69.29	61.16	62.43	35.00	50.23	54.19	55.56	58.76	56.17	34.2
April	62.20	72.16	78.90	68.33	70.37	35.00	57.09	61.33	62.79	65.70	66.60	30.0
May	66.03	76.06	80.22	72.10	73.82	28.00	69.85	65.01	67.50	68.82	67.11	23.9
June	75.51	83.40	85.26	78.76	80.73	21.00	76.28	72.58	72.20	74.82	73.20	14.6
July	76.85	82.03	82.18	75.41	79.88	18.00	81.52	74.59	71.06	70.14	72.13	14.4
August	76.27	83.10	83.82	78.75	81.25	10.90	84.40	74.65	74.69	75.92	75.08	13.2
September	72.30	77.60	80.26	74.76	76.23	26.00	82.13	70.18	70.75	71.86	70.93	28.0
October	67.37	67.09	72.38	65.58	66.81	30.00	71.66	58.08	58.87	61.09	59.31	42.6
November	60.83	65.10	69.80	64.00	64.92	30.00	59.11	58.06	59.85	60.68	59.46	33.4
December	49.61	52.86	56.93	52.74	53.06	9.32	43.91	45.42	48.22	47.58	46.07	40.8
Total averages..	62.69	68.94	72.41	67.13	67.79	27.36	63.34*	68.05	60.64	63.00	61.78	24.97
Annual averages	67.79							61.78				

MONTHS.	Temperature of Evaporation. Average at sunrise.	Average at midday.	Average at 9, P. M.	Monthly average.	Drying Power, or Force of Evaporation. Average at sunrise.	Average at midday.	Average at 9, P. M.	Monthly average.	Range.
January	43.51	53.54	48.21	48.38	1.86	8.30	2.08	4.08	23.2
February	49.35	57.21	53.96	53.54	1.86	12.31	2.13	5.43	17.4
March	55.09	61.00	59.90	56.53	1.64	13.73	2.40	5.92	30.4
April	65.03	68.16	66.73	66.64	.87	16.11	2.63	6.53	28.5
May	65.58	69.90	69.83	68.43	1.02	12.72	3.37	5.70	19.1
June	73.48	75.53	75.86	74.95	2.93	13.06	3.94	6.64	22.9
July	75.14	76.69	76.66	76.16	2.26	11.12	5.27	6.21	15.8
August	75.10	76.96	76.33	76.13	1.62	9.13	2.83	4.52	18.3
September	70.90	73.53	72.90	72.44	2.12	9.51	2.90	4.81	20.7
October	60.10	64.25	62.67	62.34	4.29	13.51	3.59	7.13	30.1
November	59.70	63.73	62.13	61.85	2.77	9.05	3.52	5.41	20.0
December	47.70	53.58	50.74	50.67	4.19	8.71	5.16	6.02	17.3
Total averages..	61.72	66.25	64.66	64.01	2.28	11.57	3.31	5.70	21.97
Annual averages	64.01				21.97				

MONTHS.	Barometer. Average at sunrise.	Average at 9, A. M.	Average at midday.	Average at 9, P. M.	Monthly average.	Range.
January	30.287	30.355	30.290	30.322	30.313	.79
February	30.243	30.260	30.204	30.420	30.238	11.7
March	30.263	30.294	30.235	30.259	30.262	.54
April	30.257	20.290	30.241	30.251	30.260	.33
May	30.226	30.264	30.228	30.230	30.237	.33
June	30.251	30.281	30.239	30.254	30.256	5.06
July	30.260	30.280	30.258	30.264	30.265	5.07
August	30.194	30.222	30.181	30.181	30.194	.25
September	30.185	30.217	30.173	30.192	30.191	.31
October	30.236	30.261	30.202	30.228	30.231	.55
November	30.331	30.355	30.293	30.337	30.329	.32
December	29.969	30.057	29.976	30.141	30.033	.91
Total averages..	30.225	30.261	30.210	30.256	30.224	2.28
Annual averages	30.224					

MONTHS.	Moisture. (1000 being saturation.) Average at sunrise.	Average at midday.	Average at 9, P. M.	Monthly average.	Range.	Extremes of Moisture. Maximum; 0 being saturation.	Minimum.	Weight of Vapor in a cubic foot, in Grains. Average at sunrise.	Average at midday.	Average at 9, P. M.	Monthly average.
January	.933	.777	.938	.882	.541	0 at 26 obs'ns.	.450	3.531	3.890	4.132	3.851
February	.945	.606	.926	.845	.464	0 " 26 obs'ns.	.536	4.294	4.535	4.908	4.579
March	.946	.642	.910	.832	.649	0 " 29 obs'ns.	.351	5.187	5.282	5.973	5.384
April	.969	.609	.921	.833	.613	0 " 20 obs'ns.	.387	6.447	6.531	7.436	6.804
May	.960	.665	.892	.842	.474	0 " 29 obs'ns.	.526	7.188	7.599	8.023	7.601
June	.899	.663	.884	.815	.509	0 " 3 obs'ns.	.491	9.028	8.732	9.548	9.136
July	.930	.703	.842	.825	.390	0 " 5 obs'ns.	.610	9.600	8.480	8.315	8.798
August	.950	.756	.915	.873	.448	0 " 14 obs'ns.	.552	9.651	9.515	10.045	9.737
September	.932	.732	.908	.857	.498	0 " 14 obs'ns.	.502	8.402	8.473	8.828	8.567
October	.876	.649	.889	.804	.650	0 " 9 obs'ns.	.350	5.761	5.870	6.539	6.053
November	.921	.726	.893	.846	.480	0 " 8 obs'ns.	.520	5.842	6.069	6.236	6.050
December	.882	.745	.844	.823	.463	0 " 14 obs'ns.	.537	3.626	4.230	4.107	4.007
Total averages..	.929	.694	.896	.859	.514	.16¼	.485	6.546	6.599	7.147	6.724
Annual averages	.859							6.724			

* I am indebted to Prof. Forsbey for this column; it was made at Carrollton, eight miles above the city, and is the average of nearly three years preceding April, 1853.

[TABLE O.]

Meteorology of New Orleans, for the year 1853.

MONTHS.	Radiation; Solar and Terrestrial. Average at Sun Rise.	Average at 9, A. M.	Average at 12, M.	Average at 3, P. M.	Average at 9, P. M.	Aspect of Sky; or amount of Clearness in Tenths. Average at Sun Rise.	Average at 9, A. M.	Average at Midday.	Average at 9, P. M.	Monthly Average
January, - - - -	.71	23.83	32.71	26.15	1.23	5.32	5.16	5.70	7.74	5.98
February, - - -	.65	23.46	34.72	20.10	.84	3.28	4.71	3.10	6.46	4.38
March, - - - - - -	1.13	25.57	26.00	16.80	1.17	5.06	4.12	3.83	5.38	4.59
April, - - - - -	.90	22.52	18.87	17.14	1.17	5.03	5.43	5.93	8.93	6.33
May, - - - - - - -	.90	21.18	16.96	21.65	.72	7.22	7.12	4.77	9.06	7.04
June, - - - - - -	.83	23.15	18.28	20.89	1.66	7.44	6.86	4.63	8.36	6.89
July, - - - - - - -	0.30	25.00	25.15	26.78	1.67	3.81	3.43	2.54	6.80	4.14
August, - - - - -	.30	25.43	34.27	29.30	.63	7.55	5.62	5.46	7.0	6.34
September, - - -	.64	25.70	25.78	27.79	2.12	5.70	5.63	3.93	7.56	5.70
October, - - - -	.39	22.04	24.83	24.06	.53	5.51	5.80	5.22	7.61	6.03
November, - - -	1.13	14.48	19.49	11.99	6.36	4.73	5.23	5.96	7.93	5.73
December, - - -	3.20	10.95	17.20	12.25	4.57	5.21	4.68	4.54	7.00	5.35
Averages, - - -	.92	22.27	24.52	21.24	1.88	5.48	5.31	4.03	7.41	5.70
Average Means,	5.90					5.70				

MONTHS.	Winds;—Their Direction and Force. North.	Force.	Northeast.	Force.	East.	Force.	Southeast.	Force.	South.	Force.	Southwest.	Force.	West.	Force.	Northwest.	Force.	Average Force.	Calm.	Am't. of Rain. In inches and fractions.	Periods of Rain. During Days	Nights
January, - - - -	14¼	1.91	3¾	1.80	3½	1.78	1¼	2.40	0¼	1.50	1.	2.	2.	1.56	4¼	2.61	1.93	0¼	3.190	1	1
February, - - -	4½	1.94	3.0	2.0	3½	2.0	5½	1.95	4	2.37	3¼	2.38	2.	1.62	2¼	2.88	2.14		4.600	5	4
March, - - - - - -	9¼	1.97	4½	2.0	3.0	2.08	5.0	1.90	4½	2.16	3.	2.08	1.	2.0	1½	2.33	2.06	0¼	6.870	8	1
April, - - - - -	3¾	1.46	2¾	1.90	3.0	1.35	5.0	2.15	7¾	1.46	2¾	1.53	2¼	1.55	1¾	2.42	1.77	1.	1.848	2	1
May, - - - - - - -	6.0	1.75	2½	2.10	5¾	1.86	4¾	2.26	5¾	2.08	2¼	2.00	1¾	1.28	1.	1.75	1.88	1.	3.840	5	0
June, - - - - - -	0¾	2.00	8¼	2.00	7.0	1.92	7.0	1.60	2½	1.80	1½	1.56	1¾	1.00	1¼	1.80	1.72	2	1.757	11	2
July, - - - - - - -	0¾	2.33	1¼	1.20	1¼	1.60	1½	1.00	3¼	1.69	6.	1.83	2¼	1.33	1½	1.66	1.58	6½	11.708	18	4
August, - - - - -	2¼	1.33	4½	2.11	9.0	1.88	1½	1.55	0¾	1.33	0.	0.00	5.	1.20	1.	1.75	1.33	17.	7.016	11	0
September, - - -	4¾	2.82	5.0	2.05	12¾	1.86	2¼	1.66	0.	0.00	0¾	1.33	1¾	1.28	0¼	2.00	1.62	3.	5.045	14	3
October, - - - -	10	1.97	6.0	2.54	9¾	1.89	1¼	2.00	0.	0.	0.	0.	1½	1.33	1½	2.60	1.54	1½	5.175	3	3
November, - - -	4¾	2.21	5	2.30	9¼	1.82	3	2.08	0¼	1.00	0¼	1.00	0¼	1.00	2½	2.11	1.59	2¼	7.032	6	3
December, - - -	1¾	2.55	2¼	1.92	6	1.83	0½	2.50	1¼	1.60	0½	3.50	2.	1.87	4¼	2.05	2.21	2¼	4.560	7	4
Averages, - - -	67	2.02	48¾	1.99	63	1.82	37¼	1.92	30¼	1.41	21¼	1.52	23¾	1.14	23½	2.16	1.78	37¼	62.641	94	32
Average Means,																	1.23				

The "Aspect of the Sky" is taken on a scale where 0 represents entire cloudiness, and parts of the sky, clear up to 10, entire clearness; and the Force of the Wind, on a scale from 0, representing calm, up to 6, a violent storm.

SUPPLEMENT.

REPORT READ BEFORE THE ACADEMY OF SCIENCES OF NEW ORLEANS.

TABLE OF CONTENTS TO SUPPLEMENT.

REPORT

READ TO

THE ACADEMY OF SCIENCES, NEW ORLEANS,

IN DEFENCE AND EXPLANATION OF THE

REPORT OF THE LATE SANITARY COMMISSION TO THE CITY COUNCILS,

By E. H. Barton, M. D., *its late Chairman.*

"*Dies errorem delet, veritatemque illustrat.*"

It was not to be expected that the late Sanitary Commission, in the fulfillment of the important trust confided to it by the Public Councils of the City, would in the investigation and disposal of the various delicate and long disputed questions before the Medical and Scientific public, so finally put them all beyond dispute, as to leave no ground for dissent. The subjects involved in the discussion have long engaged the profession and the public in the mazes of controversy. It did not flatter itself with the expectation that all these were to be settled at once. But it anticipated from the courtesy of the Profession, in view, no less of the magnitude than of the complicated character of the points involved, (being strictly those of a scientific character,) that the discussion of their merits, their value and the new principles evolved, would be temperate, courteous, and strictly confined to the subjects at issue. In this, it has the honor to acknowledge, it has not been disappointed, and that, with one single exception, the Report has met, throughout the whole Union, with a kindness of reception unsurpassed in literary annals. If there there has been any departure from the unanimity which has characterized its reception elsewhere, it is upon points where greater detail and illustration were deemed necessary in the Report itself, and we gladly avail ourselves of the opportunity, to make farther explanation; to fortify points not deemed sufficiently explicit, and to prove, by analogy, what is insusceptible of any other testimony. In pursuance of this intention we shall proceed to examine a paper addressed to the Legislature by our friend Dr. McFarlane—professedly on "Quarantine."

In analyzing this criticism on our Report, (for the greater part of it is no less,) we willingly confess, that the Doctor occupies a very different position from that alluded to above. He is a gentleman of education, and we cheerfully admit he has fine acquirements, and gifted with a most exuberant fancy, and although endowed with some extraordinarily queer notions, has that churacteristic of genius, which makes the worse appear the better reason. In the examination of this remarkable paper, it becomes our duty to say, that he is in the constant habit of supplying a most defective memory, with a most fertile imagination; fancy supplies the place of facts, and the sober and unsuspecting reader is fairly fascinated and carried away by the exuberance of its creation. But neither science nor truth requires such lofty flights, and we shall find it proper to clip the wings that soar beyond their sober dictates, and test their value by the humbler and rather vulgar standard of reality. The only trouble this examination has cost us, has been to saparate fact from fancy—to distinguish the true from the assumed, and to show that assertion is not proof. Archimedes said that "if he had a place to stand on he could move the world"—so with this gentleman—admit his data and his positions are proved. Now, this task of separation has not been an easy one, simply because, with his pruriency of imagination, he has winged his flight over periods where there exists a great deficiency of records. To be sure, it was much easier to deny the verity of his assertions at once—to meet them by assertions in turn, and call upon him for proof, which we knew did not exist. This might answer very well in a court of justice—but in a discussion before the public would be little heeded.

This gentleman has informed us that he "is the oldest member of the Profession here." Now age has its attributes as well as its privileges. From age should spring wisdom—the fruit of long and enlightened observation. But one of the sorest attributes of age, is a defective memory and inappreciation of recent discoveries in science. If, then, in the course of these observations, I shall have to point out a very remarkable failing here, he has furnished a ready excuse in the patriarchal age he boasts of. But age cannot sanction errors, and time, which writes its furrows on the brow, does not always purify the mental vision. Age and opportunities of knowlege are legitimately to be boasted of, when the evidence of their right use can be pointed out, through successful industry, exploring the mysteries of our science and in trophies which have benefitted mankind. These—these are the true triumphs of wisdom. They are putting to their proper use, the splendid education spoken of, and the fine talents we know he possesses. We shall not follow the example he has set us, but leave our cotemporaries to say, if the course we have pursued, in investigating the *causes* of phenomena whose effects have been so disastrous, as to enable us to understand and *prevent* them, is not making a better use of education and the humble talents we possess, and is not being more useful to mankind, and leaving more enduring monuments behind us, than all the corruscations of genius and all the brilliancy of a meteoric blaze.

It will become necessary, in defending our Report, to expose these errors of fact as well as errors of reasoning. If the gentleman has departed from "the established doctrines of the medical profession and of the whole civilized world," as he boastingly acknowledges, and wantonly sacrificed them for those whose tendency is to keep this country in a *statu quo*, forbidding all hope of amendment hereafter; we, nevertheless, give him credit for good intentions, because we have long known intimately the source whence they emanate. But the consequences resulting, are no less to be deeply deplored, for, if carried out, *as they have been practically carried out here for many years*, they are fraught with vast injury to the city, which we are equally sure he does not see, as they are accompanied with no recommendation for alteration or amendment—thus leaving us nothing but lamentations for the past, and without hope for the future! It was feelings very different from these which gave birth to the Sanitary Commission. This city, with no equal on earth for commercial purposes, has been staggering and struggling under a wretched reputation for insalubrity for many years, which, if it could be removed, as we are very sure it can, her unequalled resources would be at once developed; it was with the full conviction that there was something radically wrong in the constant succession of devastating epidemics—notwithstanding all the "Buñcombe" writings and assurances to the contrary, which first gave birth to this investigation into its causes. It would then have been false to their honorable appointment, false to their noble profession, and above all, false to the community which had looked to them for sound advice, and an intelligence, corresponding in some degree, to the enlightened advancement of the age we live in, did we not repudiate all such heterodox notions—notions not having their basis in common experience, are unsupported, we firmly believe, by all we know of man's nature.

The course pursued by our city authorities, for a great many years, has been empirical in the extreme—never to acknowledge that there was any need for the cauterizing hand of surgery or science, in the face of an annual mortality exceeding that of the most celebrated battles, and in a ratio more than double that of any large city in America. This disastrous course must be mainly attributed to those who, assuming the credit of having examined the subject, have been instrumental in forming a public opinion, whose effects we all see around us. These have asserted that New Orleans is "one of the healthiest cities in the Union," which was proved by an array of testimonies from various travelers as far back as a century ago! and farther corroborated by deriving the average age at death by selecting it from epitaphs on tombstones! these *irrefragible proofs* have been constantly dinned into the public ear, until finally, it has become a kind of moral treason to admit that people die here at all! and all who attempt to stem this torrent of lies and toadyism, are held up as enemies of the city—as attempting to "write down" New Orleans. And even if one dares to tell the truth in a public document,* we are accused of saying things "least flattering to New Orleans."

* Board of Health Report, 1849.

And, really, one must have some moral courage, in the face of a public opinion thus artificially formed, to dare to tell the unvarnished truth. And what is that truth? a mortality of near six per cent., for near half a century, instead of their "unparalleled salubrity!!" and an occurrence of ten epidemics of Yellow Fever and Cholera in eight years, with a mortality of 77,338 during that time, or, near half the present population of the city—officially published! To show that this is but the necessary and inevitable result of the circumstances around us—these very precise conditions have existed and produced these very results under analogous climates and conditions, wherever they have existed, and that in proportion to the cause so have been the effect, in the most unvarying manner! When pinned to the wall to account for this frightful mortality occurring year after year, the impudent and ungrateful reply is—"it only consists of immigrants!" immigrants who have made this city what it is, and consists now of no less than two-thirds of the white population. Is it not time that this audacious and miserable system of public imposition should cease, when the reputation of the country is ruined, the hand of improvement palsied, and we are losing some of the best of our citizens by emigration? Is it not time that this veil of concealment and falsehood should be withdrawn—and that we should look the facts steadily in the face? Is it not time that the truth should be told in all its naked deformity—if we ever intend making an attempt at amelioration or change? Indeed the sanitary condition of New Orleans is not, at this day *a matter of opinion*, with the mortuary returns and the census of the population before us, for half a century or more; it has, unfortunately for us, passed from opinion *to fact*, about which there is no room for dispute by any honest inquirer. The data are not contested and are incontestible. With the variation of these causes so has varied the disease. Can proof be stronger? It would really seem from all the facts, the testimony and the reasoning, that all well constituted minds would come to the same conclusion, where the weakness—where the imperfection of the argument and conclusion is, I confess, I am utterly unable to see; and it is certainly a poor compliment to the intelligence of this people to attempt to humbug them in this way. The people of New Orleans in matters to which they have directed their special attention, have no superiors in shrewdness and sagacity. Upon the subject of the public health, they, like most others, will readily submit to be flattered. The time has come, however, "to speak the truth, the whole truth and nothing but the truth." No city on earth, notwithstanding its great commercial advantages, can long sustain such drains as we have undergone. It must cease, or there is no help for New Orleans. There has been no attempt at denial of our facts, and we are very sure our conclusions are irrefutable.

In relation to the present paper—data are assumed—hypothetical views set forth, and untenable objections to our positions, which I now proceed to examine.

The following quotation embraces these unique views and objections, and I give them in extenso in order to do their author full justice.

[It was here intended to give three-fourths of the entire paper of Dr. McFarlane, to comply with the last remark—but as, wherever objection is made, the objectionable part is quoted, it was deemed superfluous.]

Let us test these averments by the rule he has himself laid down, viz.: "*That medical philosophy in order to be useful must be accurate.*" "During 1825 there were not twenty days in which it did not rain violently throughout the whole year!" This, of course, is all *ad captandum*, as there is *no record of rain* falling in New Orleans at that period, and it is just as easy to say it fell every three days; and be it remembered, that all this is from memory, a memory extending back beyond the average age of life here! But there is a mode of arriving at the *probabilities* upon this subject, which, although it has cost me some labor, is not without its value, in various relations to this subject. Failing in records, which I am convinced, after much research, do not exist, I have accurately calculated every record of rain that I have been able to ascertain has been made in the delta of the Mississippi for the last forty years. From these calculations I have learned three valuable facts:

1st. That a very rainy season in one part of the delta is very apt to exist over the whole.* 2d. That an unusually rainy and sickly season

* The great value of this information to the commercial as well as agricultural interests of the State, will be readily understood by intelligent men. I have not been called on, from the course of my argument, to extend my researches into neighboring States. But its direct bearing upon the productions of our cotton bearing States, as well as others, is obvious enough, and is eminently entitled to the regularity of national record, to be published monthly, from every parish and county in the South; and it might be made the duty of the principals of the Public Schools to do so, from instruments furnished by the State.

are commonly concomitant; and 3d. That less rain falls in New Orleans than any part of the State, (by near 19.48 per cent.) so far as any records have been made, and these records have extended from the low lands of Placquemines to the high grounds of Washita! The first is not at all improbable, because the direction of the rain-bearing winds all proceed from the same quarters—that is from the S. E. to S. W., (the Gulf of Mexico and submerged delta.) Of the second, I have before spoken in the Report, and the result of this examination still farther corroborates it. Well, then, I have the record of the year 1825 and the following years, made by myself, in this State near the Mississippi river, between 30 and 40 miles farther north than New Orleans, and the record of that very year shows *fourteen inches less of precipitation occurred than the average of* 13 *years*, and the average of the three following years were almost equally small—they were all comparatively healthy years in New Orleans, as we see by the Cemetery returns, and the strong presumption is were comparatively dry years. The year following this series (that of 1829) was one of the greatest precipitation in that record, it was a year of a severe epidemic in New Orleans, and by a like probability, a very wet year. A large amount of rain fell in the winter and spring months, in the position referred to, (in 1825) and it is probable the same occurred here—nor does it require a great deal of rain, on the much used unpaved soil of the streets of New Orleans to produce deep muddy holes.

Nor is New Orleans actually warmer now than it was 30 to 40 years ago, notwithstanding "the slate roofs and brick houses and pavements." On the contrary, and on this subject I can speak with the record before me—*it is actually cooler*, from 2 to 3 degrees on the annual average, probably arising from the more extensive clearing and draining in the neighborhood, admitting a freer ventilation, and the extension of these very brick houses complained of, which are much cooler than wooden ones.

So, also, yellow fever has been found remarkably fatal with "rag pickers, scavengers, grave-diggers, and those who dig in the streets," unless when they consist of acclimated subjects.

Again, to show that yellow fever is neither more frequent nor virulent now than formerly, I have constructed the following table, embracing all the epidemics since 1816—when the ravages of the disease began to be more definitely recorded, and divided them into four periods, *viz.:*

	Average mortality per 1000.	Average duration of epidemic inflnence
The first embracing the short period of 6 years, containing the four epidemics of 1817, '19, '20, and '22..............................	20 30-100	77½ days.
2d. Embracing next 11 years, containing the three epidemics of 1829, '32, and '33	14 62-100	40 "
3d. Extending to '42—9 nine years, including the three epidemics of '37, '39 and '41..	12 25-100	56⅔ "
4th. Extending to the present period—12 years and including the five epidemics of 1847, '48, '49, '53 and '54..............................	20 62-100	55 "

But let us proceed farther in testing the *accuracy* of the averment—"that there did not occur a case of yellow fever in New Orleans for six years afterwards"—that is, after and including 1825. The published returns of the Charity Hospital alone exhibits a record of 1344 cases during that very period! and that house usually furnishes from one-fourth to one-third of the mortality of the city. Comment is unnecessary.

But, let us proceed—the term "virginal soil" was not used by the Reporter, "*original soil*" was. The soil, as deposited by the river on its *banks*, is known to contain very little organic matter, and the simple disturbance of that soil alone, it is not believed, or *ever stated*, would produce the influence ascribed to the "terrene." What is specially denominated and comprehended under this term was distinctly stated to be the rich alluvion of the country—the marsh mud—the detritus and remains of vegetable and animal life, and to be equivalent to putrifiable substances of all kinds, the filth of kitchens, stables, vacheries, privies, and every species of filth and offal—the relics of civilized life—from whence preceeds the bad air produced by this disturbance and decomposition. These are found mostly in our back yards, in the gutters, streets, open lots, and are especially conspicuous where our pavements are disturbed, (for the pebble-stone pavement is eminently objectionable in being the *best filterers and retainers* of putrescent organic matter.) The "disturbance" of these is always very offensive in hot humid weather, (the meteorological condition) and injurious to health. So the detritus and filth of our canals and basins, when dug out or cleansed, are composed, mainly, of these same materials, also the deep cuttings and excavations for our railroads, the *first cultivation* of the soil for agricultural purposes; all are followed by sickness *when the meteorological condition is present* and of sufficient duration. These results are believed to be uniform, the proofs are positive, the facts are not denied. They are evaded by a side issue, which will be examined presently. It was never said, meant or pretended, that cutting through a *sand* or *clay bank* would produce these effects. Now, *precisely analagous to this* was the composition of the "mud of Camp and Magazine streets, and those *impassable* gulfs of 6 or 8 feet deep, in which hundreds of horses perished in 1825!" These are not offensive to smell, have not much organic matter in them, and are but little injurious to health, except from the humidity they promote, in an unfavorable season. The streets of New Orleans, from Levee to Rampart streets, were composed, originally, mostly of river mud, and afterwards covered with our wretched pavement, and it has never been asserted anywhere by us, that *that mud*, however "disturbed," would produce disease. But take up any of our ill constructed pavements in the moist summer season, and particularly of the gutters, wherein is deposited and retained most of the filth, and the nose, even at a respectful distance, will detect the difference between the materials filtered beneath them, and common mud. It was for this reason the Sanitary Commission advised the construction of pavements that would neither admit absorption or exhalation. What was asserted is expressed above, and defiance of any exception to the rule, as laid down, is offered. Since the publication of that Report, public attention has been called to the subject—numerous instances have come to light, strongly corroborative of that important truth, and none to oppose it.

The organic poisonous matter, then, is satisfactorily accounted for, without the necessity of looking for it in the "argillaceous deposit," and thus furnishes "one of the blades of the shears of fate."

But it is said—"there being a declivity of 10 or 12 feet from the elevation of the levee to the swamp, one deluging rain is at any time enough to remove all superincumbent filth, and convey it to the swamp in the rear of the city." The folly of this is made apparent, when it is known that *no surface washing* will remove that which is *beneath the surface*, and after a few hours of the "most deluging rain," filthy bubbles of the most corrupting materials, may be seen, during every sickly season (that is when the meterological condition is present) arising from the subsoil and imperfect pavements, where some little water is left. But, again, I wish my friend to be brought down from his lofty imaginings; this beautiful inclined plain of "10 or 12 feet from the *elevation of the levee* to the swamp," turns out to be, that from Levee street (not the top of the levee) to Rampart street, is about six feet, and the balance about two, in as many miles. But in the whole of this course, subject to every kind of obstructions and retardations, so that a rain, say a sudden one of one inch in vertical depth falling in an hour, (a very unusual occurrence) is positively hours in reaching the swamp, and all, who reflect for a moment, are aware of this fact, for in the central portions of the city, where the greatest declivity or inclination occurs, and where the pavements are most extensive, there exists, in fact, comparatively but few obstructions, except bridges, and we all know that it is often hours before we can pass the streets, (after such a rain as above) which then are converted into almost impassable canals and miniature rivers. How much much more so is it beyond Rampart street, where this "inclined plain" has more than four times the length, with about one-third of the declivity, and hence the necessity of deeper gutters to carry off the water and filth, onward to the swamp.

"The results of investigations made in this and corresponding regions make it manifest that wherever *heat, filth, moisture, decomposition, exhalation and malaria are combined in sufficient concentration to produce disease*, there yellow fever cannot exist!!!" The italics are his own. All this is truly "the antipodes of the doctrines of the Sanitary Commission," as "IT IS OF ALL THE WORLD." The capitals are mine. The result of investigation!!! why, it is exactly the reverse. The records of the dead—the records of the Profession—the history of every sickly place and country—the experience of all mankind, all accord in *an unanimity, no where surpassed*, that filth (in the enlarged sense) produces disease everywhere, and particularly in a warm and humid climate and season. So intimately is cleanliness associated with our ideas of health, that it has become one of the strongest instincts implanted in our nature, corroborated by divine revelation, and participated in, as a strong conservative power, by the lower animals, even at the earliest age, and man estimates and cherishes this, just in proportion to his elevation in the rank of civilization and intelligence. The causes producing it are known to be at war with his being—they consist, mainly, of effete worn out matter, of organic materials, passing from one stage of life where, in the order of Providence, they have performed the task assigned them, and fulfilled the circle of all created things, and are no longer fitted to perform this duty a second time, until their allotted round is past. The Report is most conclusive upon this subject—the facts upon which it is based are *undenied* and *undeniable*. It is there conclusively demonstrated, that filth does produce fever, and with the *meteorological adjunct*, YELLOW FEVER; that in the parts of cities where these are most concentrated, are its peculiar haunts; that these effects are in *pretty precise proportion*, both in numbers and malignity, to the predominance of the aggravated causation—and the very places, spots and houses have been designated, and not satisfied merely with a reference to other distant cities, places and periods, they are pointed out *here*, *under our very noses and eyes*—the *witnesses are all before us*—the *testimony is direct*—the *facts irrefragible*—they are undeniable; but now, forsooth, to gratify a whim, our friend has exhumed a most fanciful hypothesis from its sleep of centuries, where it never was exalted to any higher dignity than "the on dits of *travellers*." But, seriatim, let us see upon what grounds it is now hazarded. Let us examine that "demonstration which is as clear as any proposition in Euclid."

The first proposition is, that "where malaria is sufficiently concentrated to produce disease, *there yellow fever cannot exist*."

This has been most thoroughly answered in the preceding paragraph—not occurring where there could be any room for doubt—but before us all, where the real difficulty consists in avoiding to see it; where exists the festering sores of the city's filth is found the city's mortality; where year after year are offered up the catacombs of those valuable laborers, who constitute our real wealth, to the insatiate archer, and in lines of lurid light illumine the dark holes and sinks where the innocent victims of erroneous opinions and erroneous action, or want of action, could read a lesson to make humanity shudder, calling aloud for the cauterizing hand of reform, ruining the reputation of the city and blighting her commercial prosperity. But the subject is not left here; it is shown, by the most unexceptionable authorities, living and dead, with a like exactitude of time, place, and circumstances—nay, by testimony only limited by historic records, and confirmed by all reasoning from effects to causes, and vice versa—that these effects exist *wherever* these causes do, and that in proportion as they are removed, or gotten rid of, or cease, so subsides or ends the effects. Let us examine the *argument* furnished for its support, in place of and in substitute for *facts*, which are directly opposed to it.

"Yellow fever is different from bilious or miasmatic fever; this, in its progress and phenomena, is accompanied with visceral engorgement and frequent returns, which is not the case with yellow fever, and that, *therefore*, 'whenever miasmatic fevers exist, yellow fever never occurs.'" The most casual examination of any cemetery return in this city, and particularly that of 1853 and accompanying map, will most fully answer this statement. And what do these silent, but most unanswerable records show? They show, and the demonstration is before our eyes, that in this very city, during the worst seasons and the hottest and moistest months, the filthiest localities are reeking with yellow fever, while the balance of the class (for as I class them all together as proceeding from the same cause, but in a minor degree) of miasmatic fevers—as intermittent, remittent, bilious, congestive and pernicious fevers, prevail at the same time and place, as well as at other periods. The following table, derived directly from our cemetery returns, presents the simultaneous prevalence here of both, in separate columns. A very cursory examination of this table will fully satisfy the honest inquiry after truth, that the same fevers do occur in the same city and locality; the susceptibility of the subject, and the filth, etc., of their habitations constituting the only difference between them.

Relative frequency and cotemporaneous occurrence of Yellow Fever and other Miasmatic Fevers. Derived from the Official Cemetery returns.

Year.	Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	Decembsr.	Total.
1858	Yellow fever	1				2	31	1521	5133	982	147	28	4	7849
	Other miasm'c forms, as remittent, intermittent bilious, conges., per's, typhoid fevers.	40	23	20	36	39	55	94	90	89	31	18	25	560
1852	Yellow fever.............								10	68	221	no	ac't	299
	Miasmatic fevers.........	48	64	63	49	38	78	105	78	109	109	no	ac't	741
1851	Yellow fever.............								*7	*4		1		12
	Miasmatic fevers.........	51	60	*44	†39	63	‡11	*35	*59	*76	*62	61	‡35	596
1850	Yellow fever.............	1		2		1			4	62	33			103
	Miasmatic fevers.........	56	37	39	28	26	32	32	68	205	144	42	43	752
1849	Yellow fever.............							1	17	214	416	112	9	769
	Miasmatic fevers.........	40	33	62	39	48	47	44	93	70	62	43	42	593

* One week missing. † Two weeks missing. ‡ Three weeks missing.

The following memorandum was extracted from Dr. Fenner's Southern Reports, and was derived from the cases occurring at the Charity Hospital, and is further corroborative of the same.

1849.	Yellow fever.............							2	28	374	520	130	6	1066
	Intermittent fever.........	109	114	138	117	69	155	368	592	763	720	360	684	4439
	Typhus, typhoid, Remittent, bilious continuous.	91	143	225	163	164	180	160	191	285	142	101	115	1910

Thus, in precise accordance with these principles, in parts of the country where prevails the less severe forms of these fevers, the causes do not exist in such an aggravated degree as in low grounds, the estuaries of rivers, the outskirts of cities; but where they exist in an eminent degree, in hot, humid weather, in parts of cities where there is concentrated the most filth, in dark, unventilated alleys, in crowded rooms, where human offal, the worst poison of man, is accumulated, and where the habits correspond, here exists the most malignant forms of fever. These *very spots* are the birth-places and abiding homes of YELLOW FEVER; everybody, who will take the trouble, may see it in these places every year; they are the very places which give birth and prevalence to it in all cities liable to this form of fever. They have been specially pointed out in the report.

Why these effects should not always *ensue at once* from exposure to these conditions, is no more known than why some people never take the fever at all, nor than having had certain diseases once, we are no more subject to them. But we do know that TIME is an important element in the causation of disease, and that susceptibility varies with the physiological condition But who shall say we shall never know them in an investigating age? who shall set limits to the progress of knowledge? only those who never take the trouble sincerely to inquire.

Again, precisely the same exhibit is made in relation to Charleston and Savannah, as their records, now before me, abundantly prove. Whenever a cause exists to aggravate the sanitary condition of either of these places, yellow fever occurs. Accordingly, the draining, paving, and other sanitary reforms in Charleston, have made that one of the healthiest of American cities, subject to occasional epidemics, during very remarkable seasons, from some hygenic remissness. The aggravations in relation to Savannah, since the great improvement in her health, from the adoption of the dry culture instead of the wet, for rice, have been owing to special causes—some of which have been pointed out. Savannah, although having some cases of yellow fever every year, has particularly suffered from three very fatal epidemics, *viz.:* that of 1817, '20 and '53—during these the additional malignity (certainly during two if not three of these occasions) were imparted to the disease, by cutting down and leveling the streets, spreading the refuse and offal of the yards and kitchens on the streets, and otherwise disturbing the soil by digging trenches for gas and water-pipes, and filling up squares and lots with fresh earth.

Egypt — the Campagna or Pontine marshes — Walcheren and Chagres, have each their peculiarities, but afford no argument in exception to the principles laid down, as I proceed to show.

The causes of the diversity of the types of diseases of different climates, medical investigation has not yet fully developed. Of that large class denominated fevers—the main outlet of human life—varying in the estimate of eminent men, from one-fourth to two-thirds—the mystery may be more nearly solved than is now generally imagined. The Plague in the East, the Yellow Fever in the West, and the Typhus Gravior in England, are, by *general consent*, at the head of their respective classes, in these several great ranges of country. These climates differ essentially, not more in their temperatures than in their hygrometric properties, and in the mode of living of their respective populations. The climatic details are too limited in relation to Egypt to apply, fully, this mode of accounting for the plague, especially there. Two facts are well known in relation to the influence of causes readily arresting it. 1st. It is speedily put a stop to by the prevalence of dry winds from the deser . 2d. It is drowned out by the supervention of the Nile; an instance is mentioned where this was so remarkable, that five hundred less died of the plague, the day after an occurence of this kind, than the day before.

The same principles apply to Walcheren and the Pontine marshes, the insalubrious condition of both derive their controlling influences from their excessive humidity, their temperatures *are known to be too low to produce the development af yellow fever.*

Although it is not entirely true that yellow fever is confined to seaports, as supposed, or places near the sea, yet it is uncommon for it to break out or spread much in the interior—nevertheless, it is well known, and experienced practitioners will bear me out, that sporadic cases do sometimes occur far in the interior, when aggravated conditions of heat, moisture and filth exist in adequate combination to furnish sufficient cause. It is then developed without farther difficulty or need of "seeds," etc. Thus it has occurred at Natchez, Woodville, Bayou Sara, and at other places on the Mississippi, near the gulf, and insulated places far in the interior, where it was absolutely *impossible* for it to have been conveyed or imported, none being in New Orleans at the time, nor as far as we know, within 500 or 800 miles. The very idea of "germs" of it remaining over a season or so, is too ridiculous for argument and only requires to be mentioned to be repudiated by all men of experience. Thus, then, the only prop the contagionists have had, has been knocked from under them, and the true and only explanation has been made upon scientific principles. From all the observations I have been able to make—of the cause of this notable exemption, to the extent it actually does exist, it is clear to my mind, that it arises as much, and probably more, from the difference in the hygrometric properties of the atmosphere, than in differences of temperature, (of course in combination with the terrene.) This can only be proved by accurate experiments, and these have not been made.

It is to be deeply regretted that, at this enlightened day, accurate and extensive experiments have not been made with the hygrometer, thermometer, etc., in direct connection with their important bearing on human health and life. It is nothing new, I know, to attribute the origin and extension of malarious fevers to great heat and moisture, but it has been done in a very indefinite manner, and as often disputed, and no precision has been connected with it, and no principle applied, until of late. Many nave denied this connection, because the precipitation has not been large enough *in their estimation*—being unaware of that worst condition—the hygrometric state of the atmosphere—which they have at the same time unknowingly admitted in the form of mould on leather, furniture, etc. Now, it is not merely gratifying to scientific curiosity to know that this property can be detected with philosophical precision, by instrumental observation, but it is a practical fact, of the utmost value to society, as upon a foundation of a knowledge of a cause of disease alone (and this as one of the most controlling ones particularly) can we build the structure ef prevention. Sanitary laws, then, must have their only rational origin.

In the discussion of the cause of the difference of the types and grades of fever, there is an important omission, which I will embrace this opportunity to supply. Nothing is more common, not only here, but in Mexico, South America, the West Indies, Savannah and Charleston, during sickly seasons, while yellow fever may be prevailing among strangers or the unacclimated, for the natives or acclimated, to be affected with a milder grade of fever, under the same exposures—they are often so similar in type, as to be almost impossible to distinguish between the two. It is the same with the Africans (their first season) when taken to different regions, where the yellow fever may be existing, although the yellow fever proper, hardly exists in Africa, but an equivalent malignant type of fever does, to which they are habituated. This occurs constantly, when approaching in grade, they run into each other, and interchange symptoms, according to susceptibility and treatment. This difference of susceptibility satisfactorily accounts for the diversity of effects in individuals exposed to similar influences, one having a very mild attack and the other one of great ferocity, without its being at all necessary to attribute them to *two distinct* poisons; the *yellow fever in the stranger being equivalent to the milder grade of periodic fever in the native.* It is precisely similar to what occurs in a man accustomed to indulge in ardent spirits or opium, an ordinary quantity or dose, has little or no influence on him, while on one not so habituated, a real toxical effect is experienced.

This difference of susceptibility, also varies in the same individual at different periods and from different causes. We often see a man pass through one or more, nay, through many yellow fever epidemics, in the closest and most intimate intercourse with the sick, and yet with the most perfect immunity, and in a subsequent season fall a victim to it. It is, then, during the existence of an epidemic, the rule of prudence, sedulously to avoid committing any act of imprudence, that can *unbalance* the constitution during its prevalence—such, for instance, as a debauch, a fit of passion, a fall from a horse or carriage, a sudden fright, etc. I knew an instance some years since, where near a dozen young men, who during their first year had escaped the prevailing epidemic to an advanced period of the season, and who determined to celebrate their triumph by a feast, which terminated in a debauch; in the course of a couple of weeks, there was but a single survivor, and he was an invited guest and acclimated.

But there are direct, opposite and beautiful analogies in our profession to prove that the same poison or agent may produce diversified effects on the same individual, that is, act on *different organs*, in different quantities or doses. For instance, a small dose of opium exhilirates, a large one produces cerebral congestion, a small dose of arsenic strengthens and fattens, with a slow undermining of the constitution, a large one kills in a few hours, more or less; a small dose of ipecac or antimony sweats, a large one vomits ; chamomile sweats, vomits, or acts as a tonic, dependent upon its mode of administration ; and how numerous the influences do we expect from mercury, dependent upon the quantity and mode administered. Fluctuations in the weather, and particularly hygrometric changes, produce catarrh, pleurisy, pneumonia, and sometimes various intestinal-gouty and febrile affections, dependent upon the amount of exposure and individual susceptibility and predisposition. The balmy air which sustains our being, the purling brook which furnishes the pabulum for all animated nature and the deadly poison, have the same atmoic elements, limited in number, but diversified in combination, which produce such different effects. But why multiply examples, which are absolutely numberless, to prove a truism in medicine? Is there any plausible reason why there should be required a difference in the *nature* of a cause productive of fever, while a medicine, merely by a difference in quantity, should have such a diversity of effect? There is certainly none. It is in the one case as in the other, different portions of the organism are assailed *by virtues inherent in the dose*, or amount of poison, and such an interpretation is consistent with all we know in medicine and in nature. This is most aptly illustrated in the mode and rank of the organs on which the pathological influence is displayed, and thus admirably corresponds with the apt analogies just furnished. Thus the one attacks the more vital structures—the citadel of life—the brain, the sanguiferous system—those of cerebral life; the other, the *instruments*, the organs by which the body acts and continues existence, the branches—the outposts, as it were—the liver, spleen, mucous membrane, which by reaction, sympathy and symptoms, interpret the place and character of the attack, and call for treatment *through indications*. In the first, time is not allowed for this effectively; in the second it is; and it is through a long course of actions and reactions of and on the organs, showing the great difference between them.

But there is another proof, well known to medical men, which beautifully illustrates my position, although it has been most unfortunately used as an argument against it. It consists in the liability to attack; in the case of bilious or periodic fever, a second or a third time, or more, in fact, the oftener it is endured, the more liable to its repetition! This arises solely because the *organs* become more and more crippled at each subsequent attack. This is not so in yellow fever, because these organs are rarely embarrassed by the disease. It is the higher range over which it passes, and when the system is not entirely overthrown, recovery is apt to be rapid, thorough and perfect, and a remarkable renovation of the system is often known to result from it.

Let us apply these remarks and illustrations to the subject before us. Yellow fever has been denominated in the report, the highest and most malignant grade of fever known in the Western hemisphere, the proof of which is, that its mortality is much greater; so deadly are its attacks at times, that the patient succumbs in a few hours; sometimes the first symptom is the fatal black-vomit; hæmorrhages occur from all the mucous surfaces; at an early period the fatal look is exhibited, and the patient is walking about *actually dying;* there is not a pain or a symptom, (properly so called,) the sympathies connecting the system are dissolved, the fatal blow has been struck at the centre of being, and man's majestic structure is in ruins. Now, this worst form of febrile disease occurs precisely in the seasons and places, where in the concurrence of all experience and reasoning from data thus furnished, we should a priori expect it to occur, *viz.:* in the filthiest cities, where the least attention is paid to sanitary police, and in those very spots, places, houses and alleys of those cities, which are filthiest, most crowded, and the inmates of the worst habits; and it occurs just in those seasons and parts of seasons, when these effects are most calculated to have their worst influence on the human body, *viz.:* in the hottest and moistest seasons; and if there is any want of uniformity in these outbreaks of yellow fever occurring where all these filthy materials are present, it solely arises because the other constituent, (the second blade of the shears,) the meterological condition, which is either absent or defective. Here, then, is the combination necessary to render effective the poison productive of the *highest grade* of fever—*yellow fever.* On the contrary, the other forms of miasmatic and periodic fevers occur, when these execesses do not take place, in the same exaggerated degree. It is then the causes (or poison, if you will,) being in less force, the minor organs and instruments of life become assailed, and symptoms, which are their interpreters, direct to the local action and attack; now we see the liver, the spleen, the gastro-intestinal mucous membrane, the system of organic life, to bear the onus; time is allowed for reaction, and the struggle is made by the system to resist the disorganizing tendency on the special organ. The "Chagres fever," the jungle fevers of India, the bilious and marsh fevers of our own country, satisfactorily illustrate the action of all these secondary influences, and all most strikingly show the analogy between the causation of different classes of fevers with the effects before pointed out, and the influences of medicines on the system just stated. Can demonstration be clearer?

A high dew-point (may be, with other aid) will produce bilious fever, by acting on the materials of the blood and the secretions, and thus on the *instruments* of life; but for this latter (yellow fever) it requires a concentration of these agencies with others, to give intensity, and thus as we have different effects with medicines, according to their dose, so it is with these agents, and yellow fever is the result. This is not mere speculation, nor does it depend upon analogy alone, but it has every presumption in its favor, from the actual occurrence of the disease (yellow fever) under circumstances where this exaggerated condition alone exists. Can stronger proof be required?

It is easier to account for the difference in the types of fever on the thermometrical or latitudinal than on the longitudinal scale. All medical history informs us of the geographical limits of fevers, that where the temperature is high or long continued, with a great amount of moisture, they increase in malignity, (other things being equal,) as these diminish, they lose their severe type or grade, until they finally cease as we approach the arctic or antarctic poles; and not only fevers, but disease almost disappears, and navigators visit, remain months and years, and return from those regions without scarcely losing a man. But it is more difficult to say *why* yellow fever should be at the head of its class in the West and plague in the East. There are climatic and hygienic peculiarities that are still unexplored by which it may be explained, provided we seek for them in the true spirit of philosophic research, and experiment perseveringly with the means science now furnishes her votaries.

In relation to our great Western disease, yellow fever, early history has not furnished us with many more valuable facts, as to its *causation*, than it has of the plague. If yellow fever is an American disease, it was not found here on the discovery of the country, it was only *developed as a climatic influence on European constitutions;* it was only after these Western regions were occupied for more than a century, that it began to prevail; when the settlements became more or less dense, and men congregated in cities, population became crowded, the habits of colder regions were transplanted where they were so unsuitable, and tropical hygiene not understood, that it had its birth.

But science has dawned in the West in the awaking of the mind due to a new era: the spirit of the age now expects to know the *cause* of every thing, secondary agencies are the hand-maids, the interpreters of the will of Deity; it is only upon this foundation can the *true principles of prevention* (or sanitary laws) be based. It is a law to which all that is dear to man is subject, that as there is no fixed, stationary position for man or for science, the moment we stop advancing we are retrogressing. Let us, then, fully advised, use all the means which science, still in her infancy, has amply supplied her votaries, and interrogate nature with the honest and sincere desire to arrive at the truth, instead of speculating with a prurient imagination upon the half-stated and the false facts with which imperfect tradition furnishes us, and we shall thus sooner unravel the mysteries which environ this hitherto dark subject.

Scientific investigation has furnished us valuable data to begin with. I have just stated why yellow fever never occurs in the Pontine marshes, and was unknown in all the ravages at Walcheren, the average temperature being under 80 degrees, below which, it is now known, yellow fever cannot originate. It has been shown that a summer temperature of 60 degrees is necessary for the production of *fever*, and that it never appears as an epidemic, unless the temperature reaches 65 degrees. These temperatures are reached at Walcheren and the Pontine marshes, but not 80 degrees, and for the existence of yellow fever, *this temperature* must not only be reached but *endured weeks if not months.* So precise has science now extended its investigations, but we trust, it is only at the threshold. We now know why yellow fever would not spread in Charleston* when carried there in May and October last, and why, being taken to Aiken and Columbia,† at a more advanced period of the summer, it would not spread either, and that when taken to Blackville and Augusta,‡ it did spread. In the first cases there was a deficiency of heat and humidity, etc., while in the latter they existed. The condition of Augusta has been noted in the "Introduction" to the Report, that of Blackville is low, with a pond in its midst imperfectly filled, swamps surround it, and the irregularities of the ground have been filled up with offensive putrifiable materials. Of the various occurrences of the many "spontaneous cases," mentioned with such emphasis in the Report—in

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* Temperature too low.

† Temperature and hygrometer too low, and particularly the latter, and the places clean.

‡ Temperature and hygrometer very high, with abundant filth, etc.

tho absence of precese observations with the thermometer, there are other proofs mentioned. of the existence of, at least, these two agents, as well as others, and I refer, as ample proof of it, to the many "spontaneous cases" of the fever mentioned in the Sanitary Report.

And, again, I repeat the fact, which defies contradiction, that when the temperature and humidity are lowered to a certain degree, (stated) yellow fever, as *an epidemic* ceases in this latitude. These are, I believe, irrefutable truths, constituting the laws of the disease. Another is no less certain, that without the concurrence of the TWO AGENCIES mentioned in the Report—no yellow fever has ever occurred, nor, by sequence, ever can occur! No *amount* of *heat* and *moisture alone* has *ever or can ever produce it.* No amount of *filth alone, can effect it;* when concentrated, it may produce asphyxia and death;—when less, with defective ventilation, crowding and a low temperature, it may produce the worst forms of typhus and other fevers, but *never yellow fever.*

I have said that TWO CONDITIONS are required to coalesce or combine, in order to produce the alleged effect—the meteorological and the terrene—and that this latter consists of filth or decomposable organic matter of all kinds—of which I consider fresh rich original soil to be an equivalent. I have never said or believed that one alone was sufficient—yet against ONE ALONE has all the force of opposition been expeuded!

We think, then, that the following propositions have been clearly demonstrated, from the facts, by experimental observation and by every principle of fair analogy, *viz.:*

1st. That ordinary mud—consisting of the clay and sand deposit of the River Mississippi—is different from the "original soil" referred to in the Report, in this, that one has organic matter in it, and the other has not, and that it is farther mixed with every species of decomposition, and particularly, with the offals of society; that personal excreta, of all kinds, constitute the worst forms of organic matter; that yellow fever results from these, in combination with the meteorological ingredient, and that hence, it is the highest form of fever, and occurs mostly where these exist, in greatest excess, as in the filthiest parts of crowded cities.

2d. That yellow and bilious fevers proceed from the same causes, although differing in degree and amount.

3d. That these causes, acting upon individuals of different susceptibilities, (as the acclimated or native and the acclimated,) produce these different effects — in the first, developing a milder grade of periodic fever, and in the second, the aggravated form, or yellow fever.

4th. That the main pathological cause of the difference in the phenomena exhibited in yellow fever from bilious fever, arises from the difference in the rank and importance of the organs attacked in each case respectively—in the first it is on organs whose integrity is more immediately essential to life, as the nervous and sanguiferous systems, or those of cerebral life; and in the second developing its influence on subsidiary organs, or those of rather secondary importance—those of animal life, as the liver, spleen, stomach, etc.

5th. That these causes proceed from all the circumstances that impair the purity of the air, which is essential to healthy existence, proceeding from vegetable and animal decomposition of all kinds, and disturbances of the original soil—that these, in the aggregate, constitute MALARIA, together with certain meteorological conditions, which are indispensable, to give it activity.

6th. That all we know of contagion, is, that being a specific virus, the product of secretory action, *it must be*, in its very nature, independent of all these circumstances and conditions; the existence and the spread of these can necessarily have no connection with it. But, as all the condition s productive of vitiated or bad air must tend to extend the above influences, within the area of that impure air, and in proportion to that impurity and the meteorological condition, so the susceptibility to the spread of these diseases will exist.

7th. The final proof of all these propositions is, that when the conditions above pointed out are removed, or no longer exist, the effects cease, *causa sublata tollitur effectus.*

Throughout this paper I have endeavored to impress the reader with the firm belief which has pervaded my own mind—that as there can be no effect without an adequate cause—so all fevers, and at the head of them particularly, yellow fever, must have some adequate cause for its production, and I solemnly entertain the firm and abiding conviction, that we are not ignorant of that cause. Our author attributes yellow fever to "accident or specific causes." The term "accident" may be applicable to man's action—but not to the Creator's—with him, be it reverently spoken, there can be no "accident." In its reference to us, it only means our ignorance of a cause. But herein I have shown that this is a most egregious error, and that we know as much of the cause of yellow fever, as we do of any other ailment with which man is afflicted, and that, moreover, there is nothing "specific" about it. Nay, it is not too much to hope, with the better understanding of climatology, with the clear proof, now well known to every well read medical man, that fevers of every class and type have their geographical limits, and this will be the more precise, as both of these are better understood, (i. e., fevers and climate,) that the great mystery of the proximate cause of fever, that is, the *ipse morbus*, will be, ere long, unravelled. To hasten that long coveted period, to make this of real practical value, (its only use) we must push on anew in our studies of climate and its relations, for it is upon a thorough understanding of all these, as a foundation, that we can erect any rational structure of sanitary and preventive measures. This study must enter into medical education in the legitimate orthodox way, through a proper system in the schools. Let it receive its earliest impulse from this first Sanitary Commission ever instituted in America to investigate the origin of epidemic diseases, and if we shall have succeeded "in establishing a single principle in our science"—we shall, in the language of our eminent countryman, Dr. Rush, "have done that which will lead to more truth in one year, than whole volumes of uncombined facts will do in a century."